CW
MIA81OGUVYMUIVYM FCWB
UNIVERSITY MICROFILMS
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

Uncle Sam Wants Yours

By Jake Kirchner
CW Washington Bureau

Considering the blizzard that hit much of the U.S. last week, talking about taxes is probably adding insult to injury. But the timing is inescapable. With only a few days left and most of the tax returns already in, it is now safe to tell you that if you ever wanted to cheat on your taxes, this may have been the right year — the odds on being audited have sunk to a paltry 1.58%.

It is no great secret that nobody likes to pay taxes; it is certainly not a secret to the Internal Revenue Service. The agency, therefore, places a lot of emphasis on its enforcement programs, particularly its auditing and collection activities.

However, the IRS has been hit by the same budgetary crunch that is afflicting all levels of government. The number of tax returns has been growing steadily over the years, but the size of the IRS enforcement staff has not kept pace with that increase.

Last year the IRS audited 1.84% of the approximately 94,000,000 individual returns. That figure

(Continued on Page 8)

NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Framingham, Mass. and additional mailing offices ©1982 by CW Communications/Inc.

$1.25 a copy; $36/year | April 12, 1982 | Vol. XVI, No. 15

Compass Pulls OAC Crowds

By Bruce Hoard
CW Staff

SAN FRANCISCO — The crowds told the story. They stood three and four deep around Grid Systems Corp.'s Compass computer, the most popular new product at the Office Automation Conference (OAC '82) here last week.

Compass is a portable personal computer with an integrated set of software packages, a budding support network of IBM Series/1 computers and a high-resolution display screen.

Coverage of OAC '82 continues on Pages 9 to 12.

The 9¼-pound device fits into a briefcase and offers program development tools and application programs that include text editing, graphics, a project management data base, an electronic spread-sheet program and terminal emulators.

Compass software is said to support two distinct envi-

(Continued on Page 10)

Jobs Abound For DP Grads

By Bob Johnson
CW New York Bureau

NEW YORK — Metropolitan area computer science majors in the graduating class of 1982 will not be adversely affected by the depressed economy. In fact, major corporations are as eager as ever to hire students with computer savvy.

That was the general consensus of college placement offices contacted by *Computerworld* in a recent telephone survey to gauge what the job market has in store for the spring crop of would-be DPers.

Yvette Negron, a recruitment coordinator at Pace

(Continued on Page 6)

Critic: Reagan Order Shows Secrecy Mania

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — President Reagan issued his controversial executive order on government data secrecy recently with only minor revisions suggested by the order's congressional critics, one of whom immediately denounced the new regulations as symptomatic of a White House "mania for secrecy."

The Executive Order on National Security Information, which goes into effect Aug. 1, replaces classification regulations promulgated during the Carter presidency. Earlier drafts of the Reagan order were attacked for allegedly reflecting a "when in doubt, classify" philosophy and as leading to the classification of many new types of data, especially concerning technology [CW, Feb. 22].

The earlier versions were particularly criticized by the House of Representatives Government Information and Individual Rights Subcommittee and the House Science and Technology Committee. A few changes were made to the order reflecting those concerns, but Rep. Glenn English (D-Okla.), chairman of the information subcommittee, said he remains "troubled by the overall tone of the executive order."

"The order as issued is virtually unchanged from earlier drafts," according to English, who said that although "a few small improvements have been made . . . the message of the executive order still is 'Classify, classify, classify.' " He added, "The order

(Continued on Page 8)

'Sky's Limit' for Degreeless DP Exec

By Marguerite Zientara
CW Staff

LAWRENCE, Mass. — What future is there for a computer operator with no college education in a small, family-owned clothing manufacturing company? Ask Donna Plourde that question and she will tell you that the sky's the limit.

CW Photo by M. Zientara
Donna Plourde

Now in her fourth year as DP manager for Grieco Brothers, Inc., makers of the Southwick brand of men's and women's suits, Plourde began her career 16 years ago working part-time after high school filing and operating a bookkeeping machine for the Lawrence Eagle Tribune Publishing Co. here.

After graduating from high school with distinction in the bookkeeping program, Plourde joined the *Eagle Tribune* full time in the same clerical position. When the newspaper decided to computerize its operations a couple of years later, Plourde's hard work and dedication as a clerical worker made her a natural candidate for the job of computer operator, which she held for two years.

As time went on, "I let them know I was interested in learning programming, so they sent me to the Digital Equipment Corp. PL/1 course in Maynard, Mass.," Plourde recalled.

After the week-long course, "I came home writing programs and was very excited about it, but I had no opportunity to use what I'd learned because I was the only person operating at the time," she said. "I didn't see myself programming full time in that environment."

That was when Plourde

(Continued on Page 6)

IBM SPF Replacement Bows

By Lois Paul
CW Staff

WHITE PLAINS, N.Y. — IBM unveiled a replacement last week for its System Productivity Facility (SPF) for use with MVS/TSO and VM/CMS systems.

The Interactive System Productivity Facility (ISPF) and the ISPF/Program Development Facility (ISPF/PDF) run on IBM 370/158, 370/168, 4300, and 30 series systems, including the 3083 and the 3081. The software was designed to take advantage of the features of the IBM 3270 display terminals for the use and development of interactive applications, which IBM refers to as dialogs.

The packages are available separately, but ISPF is a prerequisite dialog manager for ISPF/PDF. ISPF includes prompts and menu and selection screens. Users reportedly can enter additional information through data entry display screens or through use of Help screens.

According to IBM, ISPF includes enhancements not currently available in SPF. Among these are display ser-

(Continued on Page 8)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
TM reg. U.S. Pat. Off.

Editor John C. Whitmarsh
Managing Editor Rita Shoor
News Editor Cheryl M. Gelb
Senior Editors:
Features Catherine Marenghi
Software Lois Paul
Communications Phil Hirsch
Systems Timothy J. Scannell
Office Automation Bruce Hoard
Industry Marcia Blumenthal
Management Brad Schultz
Writer/Analysts: Marguerite Zientara
Tom Henkel
Staff Writers: Jim Bartimo
Susan Hurley
Susan Blakeney
Correspondents:
New York Bob Johnson
Washington, D.C. Jake Kirchner
Phil Hirsch
West Coast Robert Batt
Jeffry Beeler
Chief Copy Editor Donovan White
Copy Editors: Dave Bouffard
George Cohen
Kathie Gow
Patricia Keefe
Steve Milmore
Betsy Morse
Linda Rosenthal
Deborah Scaduto
Barbara T. VanScoyoc
Editorial Assistants: Nancy Finke
June Fettig
Contributors:
Education J. Daniel Couger
Taylor Reports Alan Taylor
Human Connection Jack Stone
SPECIAL PUBLICATIONS
Computerworld Extra!
Editor Jack B. Rochester
Computerworld OA
Editor Ann Dooley
Copy Editor Nancy Fleming

Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES:
New York City: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Telephone: (212) 570-2135.
West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.
Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-6718.
England: Richard Hease, ECC Publications, 30-31 Islington Green, London N1. Phone: (01) 359-7481.
W. Germany: Eckhard Utpadel, CW Publikationen, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 34-98-61. Telex: 5215350.
France: Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. Phone: 720.85.66.
Asia: Mr. [illegible], [illegible] Computerworld, 1-19-7 [illegible], Chuo-ku, Tokyo 104. Phone: (03) 551-3082.
Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133. Telex: SICCO AA25468.
Brazil: [illegible], Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-0225. Telex: 2130838 (WORD BR).
Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-6218, (905) 514-6309.
Spain: Neil Kelley, Computerworld/Espana, Barquillo, 38, Madrid-4.
Denmark: Holle Lund Christensen, Computerworld/Danmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11.
Second-class postage paid at Framingham, Mass., and additional mailing offices PW127600. Computerworld (ISSN-0010-4841) is published weekly, except: March (7 issues), June (5 issues), September (4 issues), October (5 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Copyright 1982 by CW Communications/Inc. All rights reserved.
PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, MA 01970.
Permission to photocopy does not extend to contributed articles followed by this symbol. ‡
Special requests should be addressed to Nancy M. [illegible], CW Communications/Inc. Box 880, 375 Cochituate Rd., Framingham, MA 01701. ISSN 0010-4841/81 $3.00 + $.50
$1.25 a copy; U.S. — $36 a year; Canada, Central & So. America — $110 a year; Europe — $145 a year; other foreign — $240 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.
Computerworld can be purchased on 35 mm microform through University Microfilm Inc., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone (313) 761-4700. Computerworld is indexed; write to Circulation Dept. for subscription information.
ABP MCC
POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Dept., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Pentagon Goes With BBN

Brass Kills Plans to Use Autodin II

By Brad Schultz
CW New York Bureau

WASHINGTON, D.C. — The Pentagon killed plans last week to pipe data communications through Autodin II, a packet network designed by Western Union Telegraph Co. that would have featured Digital Equipment Corp. PDP-11/70 and PDP-11/44 computers.

Instead, the Defense Data Network (DDN) will be built with Bolt Beranek and Newman, Inc. (BBN) C-30 computers that emulate Honeywell, Inc.'s 315 and 516 instruction sets, according to Dr. Vinton Cerf, principal scientist in the Information Processing Techniques section of the Defense Department's Advanced Research Projects Agency (Arpa).

Bolt Beranek and Newman played a key role in designing Arpanet, whose more than 10,000 users include much of the U.S. computer science research community.

Deputy Defense Secretary Frank Carlucci authorized scrapping the five-year-old plans for Autodin II on the recommendation of Richard De Lauer, undersecretary of defense for research and engineering, Cerf said.

Not Enough Nodes

Autodin II was rejected largely because it called for fewer than 10 network nodes, he indicated. Failure of a few Autodin II nodes — due to enemy attack or some other catastrophe — would have meant breaking off a substantial portion of data communications among the U.S. armed forces and the Pentagon.

Now expected to have eventually hundreds of nodes, DDN will adopt many of the protocols and techniques featured in Arpanet, Cerf predicted. These include the Transmission Control Protocol (TCP) and Internet Protocol (IP), he noted, which are coming fast to commercial users as a means of passing data smoothly among networks featuring different brands of host computers.

De Lauer's Deputy Undersecretary, James P. Wade Jr., recently ordered the Pentagon and armed forces to procure only TCP/IP-compatible computer equipment for use in packet networks, Cerf stated. DEC has just endorsed TCP/IP, according to Cerf, who once led development of those protocols, now seen by expert observers as becoming commercial standards.

U.S. vs. IBM Hearing Delayed

NEW YORK — Federal Judge David N. Edelstein has delayed for one month a hearing into whether the settlement of the U.S. Government vs. IBM antitrust case should be nullified.

At the request of the Justice Department, former presiding judge Edelstein rescheduled the April hearing for May 19 so that the department's Civil Division could investigate recent controversy about consulting work that Assistant Attorney General William F. Baxter performed for IBM while a professor at Stanford University [CW, March 8].

Edelstein set the hearing date last month [CW, March 29] as a result of a motion by Phillip M. Stern, a "friend of the court" who questioned the dismissal of the case.

Edelstein called for the government and IBM to show cause why the suit dismissal was not improper because of Baxter's previous link with IBM.

Objectivity Questions

Questions about Baxter's objectivity in the case began when Edelstein received letters concerning Baxter's past consulting duties [CW, March 8] and amid recent reports of Baxter receiving IBM grant money while at Stanford.

The anti-trust chief removed himself from the post-trial situation on March 25 until questions about his conduct are resolved.

A spokesman for IBM said that the company "never paid" Baxter's salary and that the grant money given to Stanford Law School was distributed by the school alone. IBM had no knowledge of how the funds were administered, he said.

In a letter sent to Edelstein dated April 6, the former lead counsel for IBM, Thomas Barr, stated that IBM counsel opposed the hearing motion. He wrote, "It is plain, we believe, without doubt that without the existence of any reasonable argument to the contrary, the U.S. vs. IBM, was dismissed on Jan. 8, 1982, and that the action is no longer pending in the court and no further proceedings in the action are proper."

CW Wants Your Trivia for NCC

If your mind is the kind that hoards delicious bits of information on little-known facts about DP, *Computerworld* wants to hear from you.

CW is putting together a trivia quiz to puzzle attendees at the National Computer Conference. Know anything we should know?

Send your trivia questions and answers to Linda Rosenthal, Editorial, *Computerworld*, P.O. Box 880, Framingham, Mass. 01701.

This Week

IN DEPTH
Local-Area Networks .... Follows Page 56
Documentation ID/9

NEWS
Consulting Firm Leaves Users High and Dry 4
Univac Adds Entry-Level Unit to 1100/60 Line 5
OA Product Announcements Fill Mixed Bag 9
Speakers Agree OA Experiencing Growing Pains 11
Business, Not Technology, Seen Focus of OA 12
U.S. Won't Tinker With DP Shortage: Official 13
IBM Predicted to Unveil Local Net, PBX 14
Exec: Maintenance/Support Not for Junior DPers 16
U.S. State Dept. Puts Soviet Roboticist on Hold 16
Carrier Sues AT&T Over Hike in Enfia Fees 20
Firms Seen Going Outside for On-Line Data 23
Turnaround Time 24
NMA Annual Conference Set for St. Louis 27
Dams Schedules Miniconference 28

EDITORIAL
Editorial: In Whose Interest? 32
Softline: Software Inspections 33
Human Connection: Planning Installations 33

SOFTWARE & SERVICES
'Datareporter' Updated, Supports IBM DL/1 39
'Vsedit' Intercepts Vsam Errors in Cobol 40
'Cobmap' Optimizer Lists Cobol Compiles for IBM 41
Software Development Tool Set Unveiled 42
CGA Utility Packages Updated 43
Payroll Systems Run Under Image DBMS 47
Honeywell 'Help' Lists Applications Programs 49
On-Line Data Entry Facility Out For DEC's VAX 50
Aid Transfers Files Between Operating Systems 51

COMMUNICATIONS
GE Subsidiary Offers Local Net 53
Starnett II, Local Net, Features 16 Ports 55
GDC Unveils Enhanced Netcon-5, LSI Modem 56

SYSTEMS & PERIPHERALS
Modular CAD/CAM Systems Debut 57
Magnetic Tape Subsystem Fits IBM Mainframes 58
Maximum Security Off-Site Storage Center Opens 60

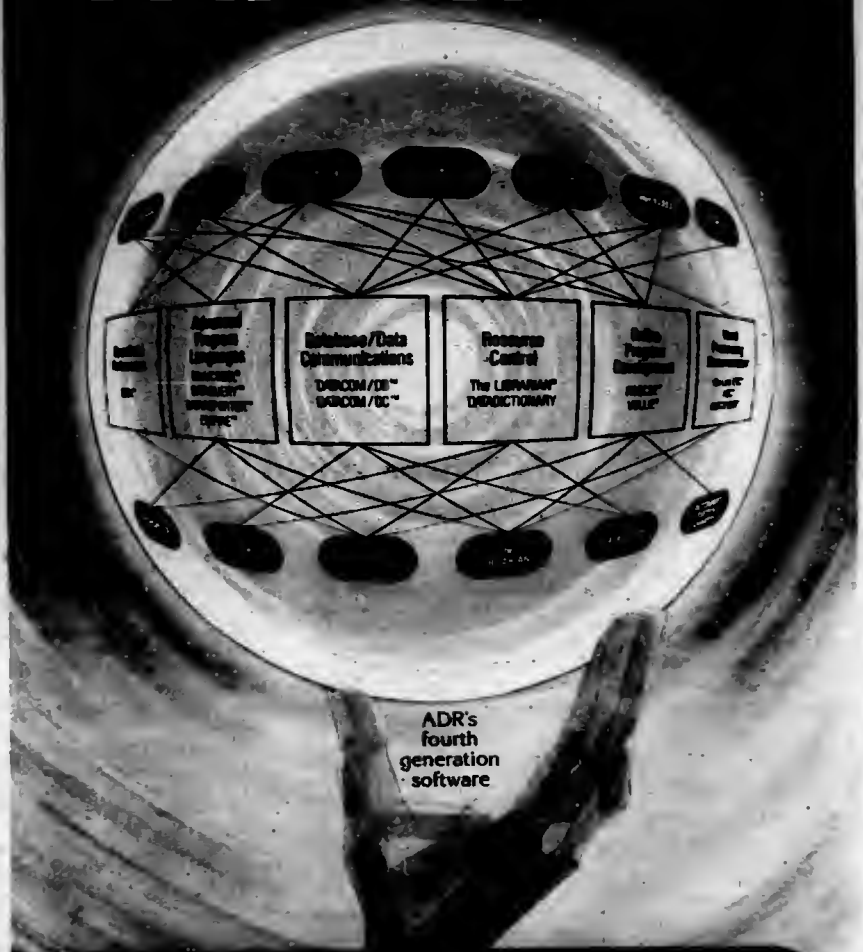
MINIWORLD
GA Releases High-Performance Minis 61
Desktop Systems Feature Hard Disk Storage 63

OFFICE AUTOMATION
Grade Levels Seen Way to Lure Top Employees 65

COMPUTER INDUSTRY
Consultant: Industry Change Not Yet Felt 69
Citicorp Wins Bid Against Adapso 69
DG Reports Drop in Quarter Earnings 72
Series/1 to Handle DG Applications 77
Three Firms Set Up Joint Venture Companies 78
MRP Software Vendors Urged to Talk Business 80

ADVERTISING INDEX 108

THINK ADR



Free seminars on:
INTEGRATED SOFTWARE and RELATIONAL DBMS.

STATE	CITY	DATE
Arizona	Phoenix/Tucson	5/12/82
Arkansas	Little Rock	4/27/82
California	Costa Mesa	5/4/82
	Los Angeles	5/19/82
	Los Angeles	5/27/82
	San Diego	5/6/82
	San Francisco	5/27/82
Colorado	Denver	5/27/82
Connecticut	Hartford	6/2/82
	Stanford	5/27/82
Florida	Miami	6/3/82
Georgia	Atlanta	6/8/82
Hawaii	Honolulu	5/6/82
Idaho	Boise	5/11/82
Illinois	Chicago	5/26/82
	Chicago	6/3/82
Indiana	Evansville	6/24/82
	Ft. Wayne	5/4/82
	Indianapolis	6/22/82
	South Bend	5/27/82
Iowa	Des Moines	5/12/82
Kentucky	Louisville	5/11/82
Louisiana	New Orleans	5/4/82
Maryland	Baltimore	5/5/82
Massachusetts	Boston	5/27/82
	Quincy	5/12/82
	Springfield	6/10/82
Michigan	Detroit	4/29/82
	Grand Rapids	5/13/82
Minnesota	Minneapolis	5/18/82
Missouri	St. Louis	5/4/82
	Kansas City	5/18/82

STATE	CITY	DATE
Nebraska	Omaha	5/4/82
New Jersey	Hasbrouck Heights	5/12/82
	Somerville	5/11/82
New York	Albany	5/5/82
	Buffalo	6/8/82
	New York City	5/11/82
	New York City	6/16/82
	Rochester	5/6/82
	Syracuse	5/12/82
	Westbury	5/4/82
	Westchester County	4/28/82
North Carolina	Raleigh	5/20/82
Ohio	Cincinnati	5/6/82
	Cleveland	5/20/82
	Columbus	6/10/82
	Dayton	6/17/82
Oklahoma	Oklahoma City	5/12/82
	Tulsa	5/11/82
Oregon	Portland	6/10/82
Pennsylvania	King of Prussia	5/19/82
	Pittsburgh	5/12/82
Rhode Island	Providence	6/9/82
Texas	Austin	4/29/82
	Houston	5/6/82
	San Antonio	6/3/82
Utah	Salt Lake City	5/20/82
Virginia	District of Columbia	5/25/82
	Richmond	5/6/82
West Virginia	Charleston	6/3/82
Wisconsin	Milwaukee	5/20/82

ADR's unique Integrated Software Network is engineered today for tomorrow's changing environments.

Relational data base systems are here to provide flexibility in changing user requirements. On-line programming systems are providing more and more interactive facilities.

Data dictionaries are becoming the central control for all programming activities. Data base design tools are beginning to arrive. Data dictionaries and library systems are merging for control of resources. Text processing, word processing, and DP are coming together. High level interactive programming is replacing COBOL and PL/1. End users are demanding information and reports immediately.

Other companies offer individual software packages to meet many of these requirements. **The question is, will they work well together?**

ADR's fourth generation software not only meet all of these needs, they are engineered as an Integrated Network of System Software to work together smoothly and efficiently. Every ADR product represents the very latest in software technology. Write for additional information and a management presentation on ADR's Integrated Network or come to the many seminars that describe ADR's Integrated Network and Relational Data Base Management Systems.

APPLIED DATA RESEARCH

The Big Difference is our integrated network.

Route 206 & Orchard Rd., CN-8
Princeton, NJ 08540/(201) 874-9100

☐ Have salesperson call.
☐ Reserve ____ seats (2 per company) for the ADR seminar to be held in
_____ on _____
(City & State) (Date)
☐ Send literature on ADR Integrated Software and Relational DBMS.

Name/Title _____
Company _____
Address _____
City/State/Zip _____
Telephone _____
Computer _____

With Act/1 CICS Programming Aid

Consulting Firm Leaves Users High and Dry

By Lois Paul
CW Staff

TORONTO, Canada — Art Benjamin Associates, Ltd. closed its doors on March 1, leaving approximately 80 users of its Act/1 CICS programming aid without support or information about where to turn for help.

Vincent Moderski, manager of technical services for Sprague Electric Co. in Ludlow, Mass., learned the bad news when he attempted to get help concerning a bug he discovered about a month ago.

His firm had what was the standard source code agreement with Art Benjamin Associates, which stipulated that if the vendor went bankrupt or otherwise failed to fulfill its support and maintenance functions, the user could obtain a copy of the source code. However, even if users wanted to activate this option, the source code was not available as it was "locked into the computer centers of the service bureaus that the vendor was using," Art Benjamin explained when contacted by *Computerworld*. "Therefore it was out of our control," he said.

"Art Benjamin Associates is not in receivership. He has closed his doors. Nobody has put him into receivership and it is unlikely that anybody will," Mike Toohey, president of Lease-Rite, Inc., Toronto, said.

Toohey is acting as spokesman for a group of secured Art Benjamin creditors who have formed a trust among themselves and have retained counsel and Peat, Marwick, Mitchell & Co. as the trust receiver. "They are taking the action to secure the asset, called Act/1, and it will be sold to a new operating company in Toronto. The company will begin to maintain and enhance the product and hire some of the original staff."

The company is looking for a North American distributor for Act/1, he continued. Westinghouse Europe, the current distributor outside North America, has agreed to continue in its role.

Why was Art Benjamin Associates forced to close its doors? Benjamin explained that it was a $9-million project to develop Act/2, a new product, that put the firm "well beyond its means." The Canadian government was a major supporter of this effort, he said, and when it began to fall behind on payments, the firm was without funding for six months.

Currently, Benjamin has formed a new company, Online People in Willowdale, Ont., to pick up the consulting and education functions that formerly were handled by Art Benjamin Associates, he said. The Act/2 project is in limbo until they can interest another firm to pick up the effort.

What do users of Act/1 do meanwhile for maintenance and support? "There is nothing I am aware of that they can do," Toohey said, as there is no one to answer the technical questions at this point. His hope is that the new operating company will be in place by the end of this week. Once this occurs, the company will make an announcement and contact each of Art Benjamin's Act/1 customers. It also will ask the Act/1 user group to call a meeting so a presentation for the members can be arranged.

Could customers get the source code if they prefer this route? Toohey was not certain about this point, but hoped that most of the current customers would not push this option as it "would not be very attractive for the operating company." If Moderski's reaction is any indication, users will wait to see what the new company's actions will be.

"Our only interest is to convey the product to someone that can operate it to serve the customers and make sure all the creditors, be they secured or unsecured, are protected," he said.

Moderski had talked with a number of Act/1 users before he bought the software about a year ago. Most of them seemed relatively pleased with the product.

Fortunately for Moderski, his installation had not been using Act/1 in a production mode. "We attempted to use the design-aid portion, not the production version." The problem is that this is not why they had purchased the software. They had just begun using it in a production mode when they encountered the bug that led to the discovery that Art Benjamin Associates no longer was available for support and maintenance.

Users Told Source Code Escrow No Panacea When Vendors Close

By Lois Paul
CW Staff

LOS ANGELES — How can software licensees protect themselves in the event that a vendor closes its doors, as Art Benjamin Associates did recently?

It is a tricky question, but Miles R. Gilburne, a lawyer with the firm of Blanc, Gilburne, Peters, Williams & Johnston here, provided some ideas for users.

In the first place, he stressed that source code escrow — an agreement whereby the vendor places a copy of the source code with an escrow agent to be released to users if the vendor goes bankrupt or fails to live up to its maintenance or support agreements — is not the panacea that many users believe it is.

In setting up a source code escrow arrangement, Gilburne suggested that users arrange for an independent third party to verify that the source code corresponds to the object-code version that they are getting and that it includes any necessary documentation.

The source code in escrow also should reflect any enhancements and modifications to the software, he said, and this should be verified.

If a vendor does not declare bankruptcy, but fails to perform agreed-upon maintenance or support (as was reportedly the case with Art Benjamin Associates), Gilburne said that the licensee should serve notice of this nonperformance and that the source code should be released.

It is not always this easy, however. The vendor can contest the breach-of-contract charge and therefore stall the release of the source code. Also, it may be difficult to determine if the error is the fault of the vendor or the user.

To avoid this roadblock, Gilburne suggested that the licensee arrange for liquidated damages beforehand in the escrow agreement. This essentially sets up a figure for potential damages to which the user is entitled if the vendor holds up the release of the source code and later is found to be in error in doing so.

Gilburne also has used a truncated arbitration procedure. If there are conflicting demands on the escrow agent, the licensee has the right to initiate arbitration proceedings to decide on the matter. This decision can be made much faster than a judicial determination, thereby holding over the vendor both the quick release of source code and, in some cases, liability for liquidated damages.

If a vendor files for bankruptcy, under the current bankruptcy laws, this alone is not sufficient reason to release the source code, he explained. If the firm still is performing its maintenance and support functions, it still is in possession of the source code and does not have to release it.

In addition, the trustee in bankruptcy has the right to void any executory contracts — that is, those in which both sides still have ongoing obligations, he continued.

Users therefore should attempt to make their contract agreements as nonexecutory as possible, Gilburne stressed, although this is difficult to attain.

Correction

In "Continued Rise in MVS Use Among Five Trends Spotted at IBM Mainframe Sites" [CW, April 5], International Data Corp. was quoted as noting in its *IBM Software Environment* report that "23% of the VM/370 systems targeted for replacement are going to become new MVS sites." This should have been clarified to indicate that this figure involves 23% of the VM/370 systems with one guest operating system, not the entire surveyed VM/370 user base.

In "JSS Package Enhanced for System/34, 38" [CW, March 29], it was reported that the enhanced version of Software Systems, Inc.'s 5280 JSS operating system runs on IBM's System/34 or System/38. Actually, the package runs on IBM's 5280 standalone small business system.

Attention VAX* users:

Before you buy your next DEC* add-in memory compare MTI's price on these direct replacements.

DEC	VAX	MTI
DEC MS750 AA 256K byte capacity $7,700	VAX 11/750	Intel MU-5750-256 256K byte capacity $1,445
DEC MS750 AB 512K byte capacity $10,200		Intel MU-5750-512 512K byte capacity $2,295
DEC MS780 DA 256K byte capacity $7,700	VAX 11/780	Intel MU-5780-256 256K byte capacity $1,445
DEC MS780 DB 512K byte capacity $10,200		Intel MU-5780-512 512K byte capacity $2,295
DEC MS780 DC 1024K byte capacity $13,800		Intel MU-5780-1024 1024K byte capacity $3,395

Save thousands of dollars on VAX add-in memories from MTI. We are authorized stocking distributors for Intel, a leading supplier of add-in memories for DEC systems.

Our Intel boards are direct replacements for DEC memory boards and are completely hardware and software compatible. Our boards perform the same as the DEC equivalents at a much lower cost yet are more reliable than any VAX memories on the market today.

MTI has Intel's full line of products. Development systems, chips, single board computers, memory boards and systems. And we are the one source for all the terminals, peripherals, systems, applications expertise and service you'll ever need for your communications network. At prices that are hard to beat. Call MTI today and save.

†New York: 516/482-3500, 212/895-7177, 518/449-5959
Outside N.Y.S.: 800/645-8016
†New Jersey: 201/227-5552
Ohio: 216/464-6688

*VAX & DEC are registered trademarks of Digital Equipment Corp.

mti

†MTI New York and New Jersey are franchised Intel distributors.

Univac Adds Entry-Level Unit to 1100/60 Line

BLUE BELL, Pa. — Sperry Univac expanded its high-end 1100/60 mainframe series last week by introducing an entry-level processor that is said to offer 25% more power than IBM's 4331-G2 system.

The 1100/61 Model B1 consists of a central processor with a standard instruction set and a main storage unit with 524K words of memory. However, memory can be expanded with an additional 262K words of storage, and two additional storage units can be added for a total memory capacity of more than 1M words, a spokesman said. The 1100/61 B1 system also has a second support processor and a system console with printer, the spokesman added.

The 1100/61 B1 has about 80% the performance and is approximately $100,000 less than the 1100/61 C1, Univac's previous entry-level gate into the 1100/60 family. The B1 introduction brings to 15 the number of systems in the 1100/60 line.

Other features of the new system include an I/O unit with a one block multiplexer and one word-channel module. The I/O expansion capabilities of the Model B1 reportedly allow space for up to two word-channel modules and one block multiplexer channel in a processing complex. Space is also provided for up to two block multiplexer channels and one word-channel module in a user's processing complex, the spokesman noted. In both cases, a maximum of one processor is allowed.

Like other systems in the 1100/60 line, the 1100/61 Model B1 incorporates a multiprocessor-based architectural design that reduces the overall size of the processor, main storage and I/O hardware. It also reportedly results in decreased power costs and environmental requirements.

The system also makes heavy use of large-scale integration microprocessor chips in the CPU and emitter-coupled logic circuitry that functions under micro-programmed control. Integrated parallel microprocessors in the B1 are said to improve system performance and increase reliability, the spokesman added.

Finally, the 1100/61 B1 is object-code-compatible and can be upgraded to the more powerful C1 machine and to other systems in the 1100/60 line.

A basic 1100/61 B1 system with 524K words of memory, an I/O unit, a system support processor, console and word-channel and block multiplexer modules costs $238,519. The five-year lease price of a similarly configured B1 system is $5,462/mo including maintenance, the spokesman noted.

The entry-level system will be available in September. Additional information can be obtained from Univac at P.O. Box 500, Blue Bell, Pa. 19424.

Referendum Could Change ACM Council

By Lois Paul
CW Staff

There may be a change on the horizon for the 24-person council that governs the Association for Computing Machinery (ACM).

The vehicle for this change is a referendum being presented to the 55,524 members for a vote this week. It includes a proposed constitutional amendment that involves placing a representative of the local chapters' board on the council.

If passed, this would enable the chairmen of local ACM chapters to elect an advocate to be the 25th council member. The additional member of council would represent the local chapters' interests. This could potentially put the chapters on a par with the representatives of ACM's 32 Special Interest Groups and publications board, who currently hold council seats. It also would give chapter members — who are largely DP practitioners, rather than researchers or academics — a greater voice in the overall organization.

Proponents of the measure include past presidents of ACM, Herb Grosch, Dan McCracken, and current president, Peter Denning. These three collaborated on the pro statement for the referendum, which will go out on ballots on April 15. However, leading the opposition are three past ACM presidents, Walter Carlson, Jean E. Sammet and Bernard Galler, who wrote the con statement.

Denning said that for some years the people in charge of council activities have been seeking more active participation by chapter members. His feeling, as one of the authors of the pro statement, is that "the time has come. This issue has been around a long time."

The opponents, however, feel that this is not an appropriate method of solving ACM's government problems, according to Denning. He said it seems that while they believe the measure might solve this problem, it could create other problems. Sammet could not be reached for comment on her contribution to the opposition statement. Carlson and Galler both refused to comment until the ballot is made public.

Because the referendum is on the constitutional amendment level, it will require that one-third of the members vote and two-thirds of those voting vote affirmatively. The ballots must be returned by May 17. Denning said that if the amendment is ratified on July 1, the council will be enlarged and the rest of the mechanism will go into effect. This means that when the next council meeting occurs, the council member will be available to represent the chapters.

New From Yourdon!

Quality Assessment of Analysis and Design Documents

If you're a Systems Analyst or Designer with practical experience, then you realize the value of Structured Analysis & Design as key tools to building high quality, error-free systems. You've followed all the rules and now, your project control is ABSOLUTE, the documents produced PERFECT. Right?

Perhaps not. It's quite possible that a combination of project priority and technological prejudice has slipped into your otherwise perfect system. You may have questioned the quality of the documents produced. Or wondered aloud, "How can I be sure I'm on the right track?"

Yourdon's new 2-day workshop will show you how to answer this question, and other soul-wrenchers like it. The QAADD course will teach you practical, CONTINUOUS quality assessment methods which can be used throughout the life of a project. We'll teach you the Art of the Walkthrough: its practical objectives and psychology. We'll teach you how to handle the verifying, evaluating, and testing involved throughout Quality Assessment. And before you're through, you'll even know how to handle the success and obvious benefits of your "new" systems' accountability.

COURSE DATES

April 21-22 New York May 19-20 San Francisco June 21-22 Chicago

It's not too late: Find out if you're on the right track. For more information on the newest of our new workshops, send coupon or call us TOLL FREE.

THE YOURDON CURRICULUM

STRUCTURED SYSTEMS
DATABASE • MANAGEMENT
Training • Consulting • Publishing

Please send me a detailed course outline on:
☐ Quality Assessment of Analysis and Design Documents
☐ Other Yourdon Seminars.
My main interests are_____

Name_____
Company_____
Address_____
City_____ State_____ Zip_____
Phone_____

Call TOLL FREE
800-223-2452
In New York call
COLLECT 212-730-2670
• 1133 Avenue of the Americas, New York, N.Y. 10036
• 851 Traeger Avenue, Suite 350, San Bruno, CA 94066 (415) 871-2000
• 110-111 Strand, London, WC2R 0AA, England 01-836-0818

Sky's the Limit For DP Manager Without Degree

(Continued from Page 1)

started looking around for a position with growth. "I saw an ad in the paper for a computer operator with opportunity for advancement. It was very close by and they hired me," she said.

It was as simple as that. Ten years later, Plourde is still at the company that has never held her back and she seems almost unaware that a decade has passed. "I keep saying I've been here seven or eight years, but actually it's been 10," she observed, adding sincerely, "Time flies when you're having fun."

After two years as an operator, Plourde became a junior programmer for two years, followed by a move to assistant DP manager. The company's IBM System/3 "was going badly, and I felt responsible for the problems, but felt I had no power to change anything, so I left," Plourde recounted.

She took a job with DEC in Salem, Mass., as operations manager, but after two weeks, Grieco's president asked her to come back to Grieco as the DP manager. Five weeks after she left, she was back where she felt she belonged and there remains.

At 32, she has been in data processing for almost half her life, is at the top of the DP ladder at Grieco Brothers and continues to feel challenged in her role. Does her lack of a college degree bother her? "Sometimes it's embarrassing when I have to tell people I never went to college because they always act so amazed," she said, "but I feel I've gotten more experience from doing the job than I would have from sitting in classes."

She has occasionally taken college-level courses she felt she needed, for example, in management, accounting and programming. But generally, "I don't feel I need a college education for what I'm doing," she said. "If I'm interested in something, I'll go learn it, but I don't feel I need a degree for the sake of having a degree."

With four programmers, four data entry workers and two operators on her staff, Plourde is well aware of their needs for advancement. One of the operators is about to become a programmer and "I've encouraged some data entry people to transfer to other departments if there was a better opportunity for them or if we felt they would be happier," Plourde noted.

Generally, however, Plourde's turnover rate is almost nil. "I'm a pretty easygoing person and it's a family company with a very comfortable, nice atmosphere to work in," she explained.

Younger Generation Lends Life To Clothing Firm's Operation

LAWRENCE, Mass. — Even though Grieco Brothers, Inc. is a small, family-owned clothing business with many long-term employees, the younger generation of management is infusing new life into the firm's operations.

"A lot of people have been here since the company was founded 52 years ago, and naturally they don't want to change the way they do things," DP Manager Donna Plourde explained.

"But it's a very dynamic company; the president is a young man whose father was president before him, and he's always trying to better the company," she said.

"You don't find that many workers now who have the dedication of those in years past," she observed. "In the past, orders were written by hand very carefully and people remembered everything they had to remember.

"But as volume increased, the company had to computerize, and now the company is trying to better the computer system it has by establishing an on-line order entry system that will take the procedure all the way through shipping into receivables," she explained.

"My biggest challenge right now is to find an on-line order entry system that will fit our needs with as few modifications as possible so the users can benefit as soon as possible," Plourde noted.

"We spent a lot of time finding out from the users just what we need, and we estimate it would take 20 man-years to develop such a system ourselves," she added, noting that "most users are very willing to accept it."

Under consideration is a system from Apparel Manufacturing Systems in Los Angeles, the only firm Plourde knows of that has the system Grieco needs for a Hewlett-Packard Co. HP 3000.

Three years ago, Grieco converted from an IBM System/3 Model 15D to the HP 3000, according to Plourde. Previous to that, the company reportedly went through a lot of changes, converting from one IBM system to another.

"We never streamlined what we had," Plourde explained. "There were errors, and the users lost confidence in the DP department. Now they'll be responsible for their own input and any errors will be their own," she said.

Favorable Job Outlook Seen for DP Grads

(Continued from Page 1)

University, one of New York City's most business-intensive colleges, said the school's Career Placement Center is seeing more companies recruiting computer science majors this year than last.

Pace offers three different B.A. degrees in computer science including management information systems (MIS), accounting information systems and computer information systems (CIS).

Major companies such as IBM, Xerox Corp., Shearson/American Express and Four-Phase Systems, Inc. are showing interest in recruiting Pace graduates this year, Negron said.

She noted that of the three degrees offered at Pace, the MIS degree appears to be particularly desirable from both the industry and student standpoint because its curriculum is not as specialized and it allows the ability for crossovers from one type of industry to another.

Negron explained that Pace students naturally gravitate to the larger companies in their career quests. "Students know that they can build their career foundation with a well established company," she said. Likewise, the companies are looking for firmly planted students, Negron added.

Companies are enticing the class of 1982's "cream of the crop" with training programs and lucrative starting salaries, Negron said. According to Pace figures, 1980-'81 graduates who majored in CIS were at the low end of the salary scale with starting salaries of $16,000/year as programmer/analyst trainees. At the high end of the scale, systems hardware representatives listed starting salaries of $23,600. Negron noted that 1982 salaries could be boosted by about $1,000.

"Our computer science graduating group is the school's second largest, and it is growing," she said.

Agreeing with the favorable job outlook was Francis J. Gallagher, coordinator of campus recruitment for St. John's University campus in Jamaica, N.Y. Gallagher sees a "firm job market" this spring for computer graduates.

Gallagher said he has had many requests from area companies. "As a matter of fact, we can't get enough people to fill the job openings we have," he commented. He exhibited some surprise at this in light of a recent survey that listed the average starting salary for a computer science degree graduate to be $22,260/year.

St. John's placement office, which has had recruiters from a number of major companies show interest in its graduates, is particularly aware of the geographical edge it has on other colleges in the country because of the large user and corporate headquarters concentration in New York.

"The metropolitan area is fertile ground for computer science graduates," Gallagher said.

When asked if the economy is slowing this year's recruitment drive, Gallagher said that he believed it is not. He explained that companies are hiring well-trained graduates as a hedge against the speed of technology, which could leave them understaffed in the future.

"There is a very definite need for this type of graduate because companies know they will have to depend on them for their future success," he said.

Although citing a 15% increase in active recruiting in spite of the recession and declining market, J.B. Tusek, director of career development at the New York Institute of Technology, revealed that demand is slightly lower than what the college originally expected.

Tusek described the increase in job opportunities as "modest," but did quote some unusually high starting salaries ranging from $27,000 to $35,000/year.

Fooled you once, shame on them. Fooled you twice,

SHAME ON YOU!

Ever been told that complete, working versions of a program were not available for on-site demonstrations, and had to settle for less?

Ever spent big money for a software product, only to find it unsuitable for your needs or full of bugs?

Ever wanted to pay for a program by the month to assure proper performance and maintenance, but were persuaded that there was "no need to worry"?

Ever had to forgo use of a good software product simply because your infrequent requirements didn't justify the price paid by much heavier users?

Ever had to shelve an expensive package just because you didn't need it anymore? Hurts, doesn't it?

NEVER AGAIN

With the Chrono-Guard System you can evaluate complete programs and pay for them by the month or by the use. After all, software is *LEASED*, isn't it? Before you make any more commitments, ask about this innovation. If you don't get straight answers from software suppliers, be skeptical. It only takes a little initiative to keep from getting burned again, and again...

Chrono-Guard TM

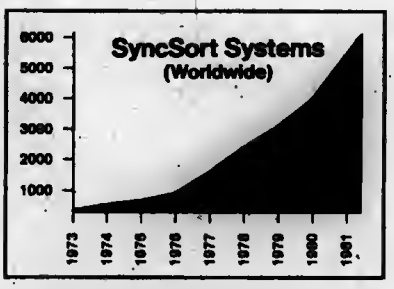
SALCRIS CORPORATION
1 Office Park Circle
Birmingham, Alabama 35223
Telephone (205) 871-4200

SUPERKID

SyncSort CMS: It's only seven months old and it already has 200 users!

Call (201) 568-9700.

Meet a chip off the old SyncSort block.



syncsort INC.

"How's our new baby doing, Doctor?"
"Terrific! I never saw a young sort program put on users so fast."

* * *

Neither have we. And we're not exactly novices at parenting sort programs.

Back in 1971 we produced SyncSort OS, which is now used by 73% of America's major data processors, according to the latest IDC sort survey. And in 1978 we introduced SyncSort DOS, which brought high efficiency sorting to DOS for the first time. Today, as the chart below shows, SyncSort has a total of more than 6,000 users worldwide.

But the rapid growth of SyncSort CMS surprised even us. At the ripe old age of seven months, it already has over 200 users. In fact, it's growing at a faster rate than its oldest sibling—SyncSort OS—did at a similar stage in its development.

Here are a few reasons why SyncSort CMS is turning out to be such a sorting prodigy:

1. SUPER PERFORMANCE. SyncSort CMS is a chip off the old high-performance block. It includes many of the technological breakthroughs we made in our OS and DOS sorts. Many of these sorting innovations are now covered by a U.S. Patent.

SyncSort CMS is highly versatile. It handles both large and small sorts with maximum efficiency. And it'll never wake you up in the night crying for more resources.

You'll be impressed by how little Elapsed Time, TTime and SIOs it requires to handle any sorting job. And you'll detect a sharp reduction in your response time, and a sharp increase in your systems throughput.

2. SUPER PROGRAMMER PRODUCTIVITY. SyncSort CMS has the same handsome features as its older brothers. Basic features like dynamic allocation of disk space, VSAM as input or output, and the ability to invoke COBOL, PLI or Assembly programs.

And advanced features like:

- INCLUDE/OMIT—chooses records to be sorted.
- SUM—summarizes designated numeric fields.
- OUTREC—reformats records on output.
- Report Formatter—for reports with headings, pagination and dating.

3. SUPER SERVICE. Our customer service is as fast and as full of tender loving care in CMS as it is in OS or DOS. About 85% of all requests for service are resolved in 24 hours.

If you'd like to meet our sorting prodigy, give us a call. We'll bring young Mozart over to give you a private recital!

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

Crunch Lowers Odds of IRS Audit This Year

(Continued from Page 1)

will drop to 1.58% this year before heading back up next year. While the audit coverage will not equal last year's any time soon, the IRS is making up for that deficiency by upgrading its computer capabilities and implementing a number of automated systems to better track and scrutinize return information.

The IRS likes to count on the rectitude of taxpayers. The system is basically voluntary in that Americans are expected to provide complete and correct information on income and to file the proper returns every year.

Of course, the IRS relies on more than moral suasion to fill the federal coffers. It has what it regards as a fairly big stick to enforce taxpaying compliance, namely whopping big penalties, fines and even jail sentences for the relatively scarce tax dodger. Withal, there are still some who succumb to the temptation to indulge in what might be termed "creative" tax compliance.

In order to stifle this creativity, the IRS plans to add some 5,225 new tax enforcement staff positions in fiscal 1983.

With an additional $154 million in funds, the IRS will target those new people at collecting taxes, identifying those who "forgot" to file returns, increasing audits of upper income taxpayers and businesses and reducing the backlog of contested cases.

The government hopes to wring an extra $1.9 billion from the collective rock of U.S. taxpayers through these extra enforcement activities. And the IRS has not neglected to provide the bureaucratic knuckle-knocking tools the new IRS gumshoes and hit-men will need to heighten administrative efficiency.

The computer hardware — some super number-crunching National Advanced Systems AS9000 mainframes and a brace of IBM 3081 systems the IRS is acquiring to upgrade the equipment at its National Computer Center in Martinsburg, W.Va.— is just the beginning.

High-Tech Systems Planned

In addition, high-tech, state-of-the-art, ultrasophisticated computer systems are being planned for IRS offices all across the land to provide the tax collecting thumbscrews of a brave new world of tax compliance programs.

One system now entering the test phase and slated for implementation in 1984 is known as the Automated Collection System (ACS). Brought to bear on accounts receivable, ACS will establish a paperless work environment for tax collectors.

The system will track accounts, initiate on its own various follow-up procedures and even automatically locate and dial the phones of recalcitrant taxpayers and perform what IRS Commissioner Roscoe L. Egger Jr. ominously referred to as "other methods for resolving delinquent cases."

Besides the various support functions offered by the IRS computer center, agency management information systems and office automation efforts, the IRS is rubbing its hands over an even more streamlined management tool now in the planning stages.

Dubbed Automated Computerized Examination System (Aces), the plan is to allow IRS service centers and district offices to draw tax return data from computerized data bases.

Aimed at getting IRS employees out from under the present mountains of paperwork, Aces would make the data available on video-display terminals.

According to Egger, auditors would conduct tax return examinations by entering information required to deal with the particular audit issues identified prior to the actual examinations.

After the data is entered, the system would compute the correct tax due and print a report that records the examination results.

The remainder of the examination process would use the system for case control, report writing and updating the master file.

The only thing the system will not do, it seems, is send the poor citizen a tax bill, a waiver of the right-to-trial form and a self-addressed return envelope for the tax payment.

That could be the next act in the long-playing Sturm und Drang of the common man pitted against the tax system.

English Raps Secrecy Order

(Continued from Page 1)

appears to expand greatly the amount of information that is subject to classification."

English, in a statement released the day the order was issued, described the new secrecy regulations as reversing the trend of the last several administrations to narrow further and to refine the government's classification authority.

The order, he said, "encourages and even requires the classification of more information. There is nothing on the public record to indicate that the limited classification policies of previous presidents are damaging in any way to national security."

English charged the "new executive order appears to have been designed primarily for the convenience of bureaucrats who want to hide their actions from the public." He attributed the tone of the order to a "mania for secrecy" which he said "goes all the way to the top of the administration."

The order as issued leaves unchanged then President Carter's provision that "basic scientific research information not clearly related to the national security may not be classified." The administration had sought to delete that section, arguing it was superfluous because the government has no authority to classify that type of information in the first place.

Critics of the earlier drafts, however, countered that the specific prohibition against trying to classify basic research data should be maintained as a clear statement of government policy.

New Classification Category

Equally troubling to some is the new classification category for "the vulnerabilities or capabilities of systems, installations, projects or plans relating to the national security." Because the provision lacks a clear definition, it is feared by some critics of the order that private-sector technology might become subject to government secrecy rules.

In releasing the executive order, however, the White House stated the government may not classify "information that the federal government does not own or control." English made it clear his subcommittee intends to pursue the matter of government secrecy and the new classification order. He said he would announce further hearings on the subject after Congress returns from its Easter recess.

The administration refused to send witnesses to hearings last month to defend the executive order. The National Security Council and the Justice Department declined to testify at that time because, they said, the order was still in the draft stage and had not gone to the president for final approval [CW, March 22].

IBM Unveils SPF Replacement

(Continued from Page 1)

vices such as light pen support and multiple line selection or modification of displayed tables; program function key support including optional usage; variable services such as user exits and inclusion of profile variables in standard variable search; and entry of APL and text character data.

ISPF/PDF is intended to increase user productivity in the development of applications by taking advantage of IBM 3270 display terminal features.

It reportedly enables programmers to write, store, browse, edit and test programs on-line at display terminals, according to the vendor. It provides split-screen capability, program function keys for invoking desired programming functions, scrolling of source data and listings in any direction and tutorial aids.

Following an initial charge of $700, the license fee for both MVS/TSO and VM/CMS versions of ISPF is $70/mo. The MVS/TSO version of this product currently is available; the VM/CMS version is expected to be available in the second quarter of 1982. ISPF/PDF-MVS, which is available immediately, has an initial charge of $1,000 and a monthly license fee of $250. The initial charge for the VM/CMS version of ISPF/PDF, which the vendor intends to make available in the second quarter of 1982, is $900. The subsequent monthly license fee is $150.

More information is available from IBM at 1133 Westchester Ave., White Plains, N.Y. 10604.

smarter

Multiplexing at its best

Datagram sets a new standard in multiplexers by allowing error free transmission of data while at the same time providing the necessary diagnostics and statistics package required to prevent system failures.

Features

Asynchronous channel support
- Selectable per channel
  - 1-10 to 9600 bps
  - Autobaud up to 9600 bps
  - X-ON/X-OFF or RTS/CTS flow control
  - Echoplex
  - DTE/DCE jumper block
- 3, 5, 7 or 9 asynchronous channels support (Cost efficient 2 channel upgrade)

X.25 High speed composite link
- Error free concentration utilizing X.25 for its high speed composite link at speeds up to 19,200 bps (internal or external clock).
- Aggregate of 79,800 bps

The extra bonuses provided at no additional cost are:
- Statistics providing for each individual async channel: the total number of connections (DTR or DSR Transitions) and the amount of data transmitted and received — and the X.25 composite link: the total number of packets, reject packets and data packets transmitted and received
- Supervisory Console Port — user switch selectable
- Diagnostics to test individual system components, to on-line monitor any data channel, to accomplish individual local or remote X.25 and terminal port loopbacks

Datagram

Datagram Corporation: 11 Main Street, East Greenwich, Rhode Island 02818
Tel.: (401) 885-4840 Telex: 00-952181
Canada: Tel.: (514) 855-3200 Telex: 05-268621

From Networks to WP

OA Product Announcements Fill Mixed Bag

By Bruce Hoard
CW Staff

SAN FRANCISCO — The mixed bag of product announcements at the Office Automation Conference (OAC '82) here last week was comprised of systems, software, word processors, facsimile machines and more.

Computer Consoles, Inc. unveiled its Office Power System for word processing, electronic mail, electronic filing and executive support. The Unix-based system links several workstations consisting of a detachable keyboard and an intelligent CRT terminal to the vendor's Model 5001 computer.

Executive support functions include an appointment calendar, assignment or project reminder file, address and telephone directories, a telephone log and a calculator consisting of a number of computational tools including a mathematical spread sheet.

The price for the Office Power System — a typical system with 24 CRT terminals and Model 5001 computer — is $170,000 or it leases for $5,112/mo, plus maintenance, Computer Consoles said from Suite 401, 1000 Potomac St. N.W., Washington, D.C. 20007.

Burroughs Offers WP

Burroughs Corp. introduced its Ofiswriter 400 word processing system. The device features an electronic document distribution system that stores frequently used distribution lists. Documents may be transmitted at any time chosen by the sender, and there is an autodial/autoanswer capability.

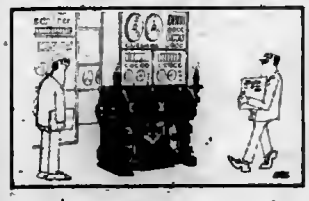
The company is also offering an optional CP/M Release 2.2 operating system as part of its effort to give the Ofiswriter 400 personal computer capabilities. Users can add a Microsoft, Inc. Basic-80 interpreter, which will allow them to write their own programs or key in other Microsoft Basic-80 programs.

A single-disk Ofiswriter 400 system without printer begins at $4,900 or $200/mo on a lease. The purchase price for the two-disk system starts at $6,000 or $250/mo on a lease, the Burroughs Office Systems Group said from Danbury Executive Tower, 30 Main St., Danbury, Conn. 06810.

The Omnifax G32 digital facsimile machine introduced by Telautograph Corp. sends or receives high-resolution thermal image facsimile copies of letter-size documents in 40 seconds, the vendor claimed.

It costs $5,750 from Telautograph, 8700 Bellanca Ave., Los Angeles, Calif. 90045.

A plug-in intraoffice print network operating from desktop to desktop was unveiled by Entercom Corp. It consists of one to four host consoles and up to 800 desk consoles. The Entercom system is designed to provide instant distribution of inquiries, replies and incoming telephone messages, each automatically coded with time, date and sender.



A typical configuration costs $20,000, Entercom said from Suite 412B, 1101 San Antonio Road, Mountain View, Calif. 94043.

Vector Graphic, Inc. took the wraps off software for its Vector professional series of software products that is said to enable microcomputer users to combine financial data and graphics into a printed report and automatically send the completed document to one or hundreds of remote locations.

The five-part series integrates communications, word processing, financial modeling and graphics with a data manager that puts them together. The software runs on all of the vendor's systems.

CW At OAC '82

The series includes the following packages: Accuchart for graphics; Conect, the communications package; Datamanager, which pulls the packages together; Memorite III, which is word processing software; and Execuplan II, the financial modeling software.

In order, those packages cost $295, $150, $495, $450 and $150, Vector Graphic said from 500 N. Ventu, Park Road, Thousand Oaks, Calif. 91320.

For journalists, a software package with the ability to organize notes, quotes and ideas was introduced by Pacific Software. Sequiter augments the traditional style screen editor/word processor with a relational data base system. It costs between $3,495 and $8,500, depending on the device configuration, Pacific Software said from 2608 Eighth St., Berkeley, Calif. 94710.

Free Space Fragmentation.
Poor Data Set Placement.
Over Allocated Data Sets.
Multi-Extent Data Sets.
Inaccurate VTOC's.

COMPAKTOR is a Disk Management Utility Program which can reorganize Direct Access Volumes.

Free Space Consolidation
Data Set Placement
Data Set Consolidation
Reports
Reclaim Space
3000 Users
VTOC Management
Free 60 Day Trial

INNOVATION DATA PROCESSING

Grid's Portable Compass Proves Hit of Show

(Continued from Page 1)

ronments — a development side for users who wish to write their own programs and an application side for solving business problems, Grid said.

Developmental tools include five languages: Pascal, C, PL/I, Fortran 77 and Microsoft, Inc.-compatible Basic. Also included is an editor and a macro assembler.

Applications software packages offered with the system include:

- Gridfile, which provides a relational view of data with data entry and query language capabilities.
- Gridplan, an electronic spread sheet with consolidation capabilities.
- Gridplot, which allows users to work their data through standard business graphics and print results in formats that include both chart or graph and characters.
- Gridwrite, which provides word processing capability.

CW At OAC '82

- Gridpath, a project management system with summarization capabili[illegible] let users initiate and track critical path management tasks.

The system uses a single-user operating system with full multitasking capability and dynamic task management called the Compass Computer Operating System (CCOS). A Unix-like file system allows files to shrink and expand dynamically without preallocation to eliminate concern over file capacity and location, Grid said.

A bit-mapped, flat panel display that folds down and measures 4¾ in. by 3½ in. can produce characters along with charts or graphs. A matrix density of 320 by 240 dots produces graphics images in amber. For text editing applications, the screen can display as many as 24 lines and up to 70 proportionally spaced characters.

The Compass' "leveraged learning" interface allows applications packages to share the same software commands. Of the 18 possible commands that operate the systems, 14 are universal to all programs. The 18 are said to go to the proper function directly, eliminating branching through separate menus and submenus.

Offering a 57-key board, and providing 256K bytes of random-access memory and 256K bytes of fixed bubble memory, the Compass is one of three components forming what Grid calls its "Navigator system."

The second component is Grid Central, which allows users to access Grid's network of Series/1 support computers in Mountain View, Calif. Another Grid Central is planned for New York, the vendor said. Users reportedly will be able to store and retrieve programs, access and store data and send and receive messages by electronic mail over standard telephone links.

An electronic software distribution scheme allows the vendor to update and revise systems software and perform diagnostics and other service functions remotely.

Companies that require the support capabilities of Grid Central but prefer to support their compasses internally can install an in-house Compass central computer, an option that is the third component of the Navigator system.

Built-In Modem

The Compass personal computer features a built-in 1,200/300 bit/sec full-duplex Bell-compatible (211A/103A) modem that provides autodial and autoanswer operation. The first of two modular jacks on the back of the unit provides direct connection to the public telephone system for voice or data transmission. The second jack is for a telephone handset, which allows the systems to be used as a power-assisted telephone for voice communications.

The initial set of terminal emulators includes the IBM 3101, 2780, 3780, 3741, 3275 and 2770, as well as the standard teletype, the vendor said. The integrated modem is capable of operating in start/stop binary synchronous communications and bit-synchronous communications modes.

The basic Compass computer costs $8,150 and will be available in September. As a combined package, Gridfile, Gridplan, Gridplot and Gridwriter cost $975. If bought separately, the total cost is $1,175.

Final pricing has not been set for Gridpath or the software development tools.

Grid is located at 2535 Garcia Ave., Mountain View, Calif. 94043.

Need Accounts Receivable? Need Order Entry?

300 user-years have taught us a lot about customer service software

Let's talk!

Customer Service Software is not financial software—order entry is not like payroll; accounts receivable is not like general ledger. Quite simply, Customer Service Software helps you be much more responsive than your competition to customer needs and at the same time improve your collection efforts and cash flow. Isn't that what being in business is all about?

Computeristics has successful installations in large corporations like Standard Oil (Indiana), as well as in dynamic growth companies like Ocean Spray Cranberries. But do ask for our complete reference list, not just a couple of showcase accounts.

If your mainframe is IBM 370 compatible, let's talk about CustomAR and CustomORDER systems.

Call us now, while you're still thinking about it.

(203) 288-2834

Name/Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Computer _____
(make, model, operating system, TP monitor, file access)

Telephone _____

Mail to: Mike Mettler,
Marketing Manager
2 Skiff Street
Hamden, CT 06514

computeristics, inc.

The customer service software people

SYSTEMS DOCUMENTATION, INC.
"Shirtsleeves Productivity"

Writing and preparation of:

USER MANUALS, SYSTEMS/PROGRAMMING MANUALS, OPERATIONS GUIDES/RUN BOOKS, AND OTHER RELATED TRAINING MATERIALS AND DOCUMENTATION

208 Main St., Ft. Lee, NJ 07024
(201)592-8745 (212)724-5065

Field Seen as Puzzle

Speakers Agree OA Experiencing Growing Pains

By Bruce Hoard
CW Staff

SAN FRANCISCO — Judging from remarks made during the opening overview session of the Office Automation Conference (OAC '82) here last week, "Growing Pains" might be a more appropriate theme than "The Human Connection," which was the official choice.

Some quotes supporting that idea included "You cannot just routinely automate," "Workers may or may not need to identify with their jobs" and "Integration is like teenage sex." The conference was sponsored by the American Federation of Information Processing Societies, Inc.

Bob Johansen, director of programs, telecommunications and computing at the Institute for the Future, described an organization as a process. The chairman of the "organization and management concerns" subset of the conference said informal organizations within companies may be more important than formal ones because they bring together the people who compose the work process.

"The essence is the process, the way things mix together," he said.

Likening the emerging office automation field to a puzzle, he added, "If you're not puzzled, you just don't understand the situation."

In order to help rectify that situation, he offered some suggestions to users.

"Pulse taking or keeping up on the latest developments is important," he declared. By keeping current, users can make sense of change and translate that knowledge into the strategic planning process.

"Management is the stirring and the steering of an organization," he observed. However, senior management, which can play a key role in putting together the office automation puzzle, has tended to remain aloof and remote from that decision-making process so far.

Johansen predicted a "gathering organizational storm" over office automation, because not enough people have learned from the mistakes of the past. Storm clouds are also gathering over the battle for control of the office. "It's just not clear who's in charge of office automation," he said.

James H. Bair, manager of office systems research with BNR, Inc. and chairman of the conference subset titled "Individual Issues," talked about the roles of motivation and satisfaction. Both factors must be present if a successful automated office is to be implemented, he claimed.

"The individual is the resource to invest in, not the technology," Bair declared. Individual users must act as counterweights to the vendors and managers exerting pressures on them. There is pressure from vendors for maximum market penetration while managers are penurious and hesitant to invest in technology. Individuals must shape those forces into "user-driven design," he said.

The chairman of the subset "User Interface and Usability," Eric Carlson, said the interface must bridge the gap between users and organizations on one side and vendors on the other. Carlson, who is manager of advanced applications systems at the IBM research labs in San Jose, said office workers are "discretionary users" of office automation who must

CW At OAC '82

believe in the technology before they will embrace it.

He noted that legislation and standards "to tell us what 'easy to use' means" are still on the horizon, and the cost of poor usability can be high for vendors who fail to convey it.

"I have never talked to a vendor who said his equipment wasn't easy to use," Carlson commented. Because of that, users must scrutinize equipment closely to make sure vendors support tasks as well as functions.

"We really are trying to get technology to support a global community of users," said Joseph Ehardt, contributing editor to Seybold Publications, Inc. and chairman of the "Communications and Systems Technology" subset.

He emphasized that information must be shared by "many, many people" and cited the need to incorporate such devices as telephones, word processors and other desktop tools into a comprehensive, multifunction workstation.

Several types of communications technologies are germane to the global community of users, he explained.

Alexia Martin, management systems consultant with SRI International Inc. and chairwoman of the subset titled "Integration Issues and Case Studies," maintained that integration is different for each organization.

'Data Slaves' Protest at OAC

SAN FRANCISCO — "Office Automation Is for Automatons."

"IBM: Intensely Boring Machines."

"Data Slaves."

These and other slogans hand-painted on placards carried by seven demonstrators greeted lunch-time strollers outside Moscone Center, the site of the third annual Office Automation Conference sponsored here last week by the American Federation of Information Processing Societies, Inc. The demonstrators were members of a local organization that consists of about 20 secretaries and programmers who volunteer their lunch hours to protest office conditions in particular and work in general.

The organization — which is so informal it has no name — publishes a quarterly 68-page magazine called *Processed World*, which it sells for $1.50 ("cheap") on the street. A four-issue subscription ranges in price from $5 for "low-income subscribers" to $150 for "corporations and governmental agencies."

Reflecting the composition and philosophy of its members, *Processed World* claims to be a "totally underground publication supported entirely by readers' donations. Produced by a fluctuating group of dissidents and malcontents, most of whom are working in San Francisco's financial district as 'information handlers,' the magazine has been established to facilitate contact between dissatisfied, rebellious office workers and to provide an outlet for critical reflections on the modern world."

SAVE UP TO 50%

On IBM Installation or Deinstallation

LET OUR EXPERTS HANDLE YOUR IBM 370/303x SYSTEM AND YOU'LL...

SAVE SAVE SAVE

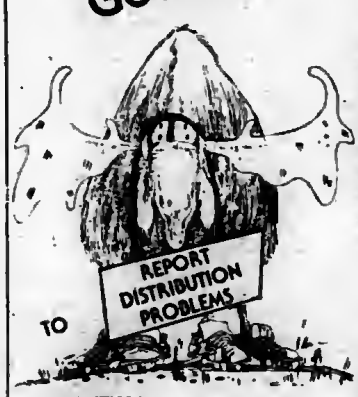
Guaranteed IBM Maintenance Acceptability

IBM FEATURES AVAILABLE

3851 Extended Channels 3033-S
3851 Extended Channels 3033-N
Attached processor for 3031
Memory for 3031, 3032, 3033

Call us today
CIRCLE COMPUTER SERVICES, INC.
312-884-2424 920 Remington Rd. Schaumburg, IL 60195
offices in Tokyo, Japan and Surrey, England

Say Good-Bye!



MANTISSA
Report Management Systems
244 Goodwin Crest Drive, Suite 200
Birmingham, AL 35209
(205) 945-8930

Why do you think they call it HARDcopy?

Report distribution and report backup/recovery are the plague of almost every Operation Manager's existence. Programming managers, too. Day in, day out. It's the same old tune.

- Lost and Mis-routed Reports
- Wrong Number of Copies
- Programming to Support RJE Routing
- Tied Up Tape Drives
- Reruns for Lost Reports
- Microfiche for One User, Hardcopy for the Rest
- Wasted Paper
- Growing Distribution Staff

For years it has been either change the application or suffer the consequences. Report management problems seemed to be permanently entrenched.

Until Now.....

Now there is a comprehensive set of report management utility systems for MVS and DOS/VS(E). Beautifully simple, they permit you to manage report data through easy-to-understand commands and without changing your application programs.

The REPORT DISTRIBUTION SYSTEM

RDS™ can consolidate all the report data for a given endpoint. Segment reductions (and a corresponding distribution workload reduction) of up to 90% are possible. RJE routing is a breeze. That's just the start, there's more.

- copy variation by report within endpoint
- custom separator page generation
- report-manifest by end user (who's on first?)
- early print start by end user
- report Broadcast - send a copy to another endpoint
- manifest for operations problem resolution
- attribute assignment by end user (class, disp, etc.)
- selective end user reprint

QSERV™ - Backup and recovery made easy

Backup of reports no longer requires a dedicated tape drive for each report. Reports may be accumulated and grouped on our archive file for subsequent reload to the spool file. Each report is individually named and date/time stamped making subsequent recovery a cinch.

Tired of the Hassle?

Why not join the other users of Mantissa's Report Management Systems and stop Report Management problems dead in their tracks. Join us as we say good-bye!

Business, Not Technology, Seen as Focus of OA

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — Improving business effectiveness should be the center of attention in the office of the future.

This was the main message from Michael Hammer of MIT's Laboratory of Computer Science to attendees at the Office Automation Conference (OAC '82) here last week. Speaking on functional integration and support of the business process, Hammer said many people ignore substantive issues and emphasize trivial aspects instead.

"People are asking the wrong questions. Our principal focus should be on the business, not the technology.

CW At OAC '82

"Office automation is not the answer to improving organizational performance," Hammer asserted. "It can be part of the answer, but it is a means to an end, not an end in itself."

Office technology, he claimed, is best seen as a catalyst. But it is not the goal of office automation to improve efficiency. "We should be concerned with doing the right thing, not doing our thing better, particularly if it turns out to be the wrong thing to be doing in the first place."

Information Overload

Hammer warned of the danger of information overload, which could result from an uncritical appraisal of technology. This could actually hamper the effectiveness of the organization.

"Office automation is not a technological issue. It is fundamentally a business and a management issue," he claimed.

A larger view of the office automation debate is required, according to Hammer. Those who lead the office automation revolution will be those who can transcend narrow technical perspectives and become business people, he maintained.

But, Hammer warned, office automation specialists are in for a tough time establishing credentials within organizational structures. "Often, OA [office automation] specialists have a checkered reputation in organizations. They have been tarred with the DP brush — systems installed late and way over budget."

To establish credibility, he argued, office automation specialists will have to establish nonadversarial relationships with their line management and act as consultants and treat clients as genuine customers.

To be effective in an organization, Hammer stressed the need to clarify office automation objectives. How, for example, would managers determine what factors constituted an increase in productivity resulting from new office technology?

"Is twice as many letters, memos and meetings twice as good?" he asked. "Sometimes it is twice as bad. Usually it is twice as irrelevant. We have to know what our objectives are and then we can use the technology at our disposal. If you don't know what your objectives are, there's a pretty good chance you won't meet them," he pointed out.

Establishing these objectives, Hammer said, requires the implementation of detailed systems analysis of what is actually going on in the organization.

Software Designed Exclusively For IBM System/38

PRISMS™ software is the ideal ready-to-run order entry and inventory control system for distribution and manufacturing operations.

Designed exclusively for IBM's System/38, it is proven, on-line, "native-mode," interactive software which eliminates conversion worries and delivers the 38's full potential.

PRISMS™ gives you the full spectrum of key functions in one powerful, easy-to-use package: Order Processing, Inventory Control, Accounts Receivable, Purchasing/Receiving, Accounts Payable, Sales Analysis and Mail Order operations.

Call or write today. We'll respond immediately. The sooner you install PRISMS™, the sooner your System/38 will deliver the goods.

Softmatics Corporation, 44 Mall Road, Burlington, MA 01803, Telephone (617)273-3420

PRISMS™ is a registered trademark of American Computer Sciences, Inc.

SOFTMATICS CORPORATION

'Approachable And Appropriate' Said Key to Right Office System

By Bruce Hoard
CW Staff

SAN FRANCISCO — The right office system must be appropriate and approachable, Patricia Seybold, of the Seybold Reports on Office Systems, The Seybold Group, told attendees at the Office Automation Conference (OAC '82) here last week. The conference was sponsored by the American Federation of Information Processing Societies, Inc.

Defining appropriateness may be difficult because an office automation system, unlike most word processing systems, may be used by a wider class of workers performing a greater array of functions, Seybold said.

To be approachable it must be learnable without instructions from classrooms or manuals. Most users are not willing to spend more than an hour acquainting themselves with a system, the consultant noted, adding that computer-aided instruction is the best way for users to educate themselves.

Plateau of Functionality

Depending on the tasks performed, people reach a plateau of functionality. They stay at the plateau until they are either intrigued enough to go on or forced to learn more by the demand for new applications.

However, although most people assume that as functionality goes up, usability goes down, Seybold disagreed. "The reality of the situation is the opposite," she declared.

For example, someone using an office system exclusively for text processing, will be "lured" to a new level of functionality when they are required to perform indexing and outline formatting for a formal report. Concepts differentiate those plateaus, she said.

'Virtual Environment'

Seybold referred to the "virtual environment" as a goal of office systems. In such an environment, one tool like a telephone or terminal may act as a "window" to the telephone system or a multicomputer network. The idea is for the user to sit in one remote location and perform processing in another. Currently, that capability is complicated by system-to-system incompatibility, Seybold explained.

To be usable, office systems must also be adaptable to the interruption-prone environment of the office, she continued. Potential buyers should ask vendors what will happen if they are in the middle of a task, the phone rings and they want to enter a message from that call into the system.

In addition, systems should be designed to help the user if he forgets a file name or makes a mistake with a new application, Seybold explained. The human mind wanders from idea to idea and the system should be supportive of that process.

"Consistency is the hallmark of a good user interface," she observed.

Now Paint Your Own Screen

All-Screen™ is the new standard in interactive data entry and inquiry systems for Human Resource Management Systems software.

All-Screen provides unlimited screen-building capability to completely design menus and data entry and inquiry in any format, including existing company forms. No more obsoleting turnaround documents.

All-Screen gives your Human Resource Department immediate and direct on-line access to all Personnel, Payroll and Benefits Administration information on Genesys software.

All-Screen is totally "user-friendly". Use English, French or Spanish and whatever naming conventions, codes and numbering systems you please. No more lengthy operator training.

Today is the day you can update with All-Screen...the system that reduces your programming and data entry/retrieval backlog, with complete security.

The only Human Resource Management System software that automatically integrates all employee data with an on-line screen developer, report writer, and is compatible with any or all of your Genesys software packages.

Genesys SOFTWARE SYSTEMS, INC.
10 Grafton St
Lawrence, MA 01843
(617) 685-5400

Genesys, 10 Grafton St., Lawrence, MA 01843 AA - 4
Please send me your brochure on these Genesys packages:
☐ Payroll ☐ Personnel ☐ Benefits Management ☐ All-Screen™
Name _____ Title _____
Company _____ Telephone _____
Street _____
City _____ State _____ Zip _____
Hardware _____

Private Sector Preferred

U.S. Won't Tinker With DP Shortage: Official

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — While technical manpower shortages are of increasing concern to Congress, recent statements by an Office of Management and Budget (OMB) official indicated that the White House may not be receptive to any new legislation designed to help alleviate the shortages.

A number of bills moving on Capitol Hill would provide support for computer sciences and various engineering fields currently in dire need of qualified instructors and graduate students. But OMB Deputy Assistant Director Hugh F. Loweth said federal intervention in this area would be an "endless morass."

Loweth told a meeting of the Institute for Electrical and Electronics Engineers (IEEE) here that the administration feels "government involvement in trying to tinker with manpower supply and demand is hot well justified."

Loweth, head of OMB's Energy and Science Division, told the IEEE briefing on federal research and development support that the manpower problem is best left to marketplace forces. The engineering profession is sufficiently lucrative, he said, to attract the required numbers of students.

Fellowships Emphasized

But an official of the National Science Foundation (NSF) — the government's main supporter of nonmilitary research and development — said the NSF is beginning to place more emphasis on fellowships in computer sciences and engineering, "areas of obvious national shortages."

Assistant NSF Director Jack Sanderson said the foundation is very concerned with engineering problems. But, he added, "the commitment to engineering and the recognition that engineering had to grow came just at the time when the budget picture went negative."

NSF support for science and engineering education is being phased out. The fiscal 1981 NSF budget for this item amounted to $70.7 million. Fiscal years 1982 and 1983 amounts are $20.9 million and $15 million, respectively.

The sharp cutbacks "strongly reflect the administration's point of view about the federal role in education," according to Sanderson, who called the budgetary decision "a judgment call at this point."

NSF support for education has been "a political football going back all the way to the Nixon administration and as time has gone on there has been a lot of hardening in both sides [of the issue]," he said.

Putting aside the broad issue of engineering education support, Sanderson said "computer engineering is a subject we're currently looking at fairly closely." Computer research is financed through several NSF programs, but the primary program in this area calls for fiscal year 1982 funding of $25.7 million. Fiscal year 1981 funding was $22.3 million, and next year's budget calls for $29.3 million for computer research.

High priorities in the fiscal year 1983 budget, he said, include support for programs in microelectronics, robotics and special-purpose computer architectures.

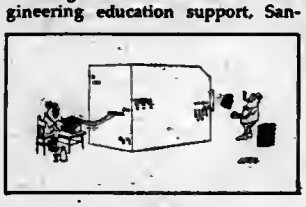
He also said that the foundation will hold two conferences this summer — one on computer research support and one on the need for what he called "massive number crunchers," which he noted will be held in time for this September's planning of the fiscal year 1984 budget.

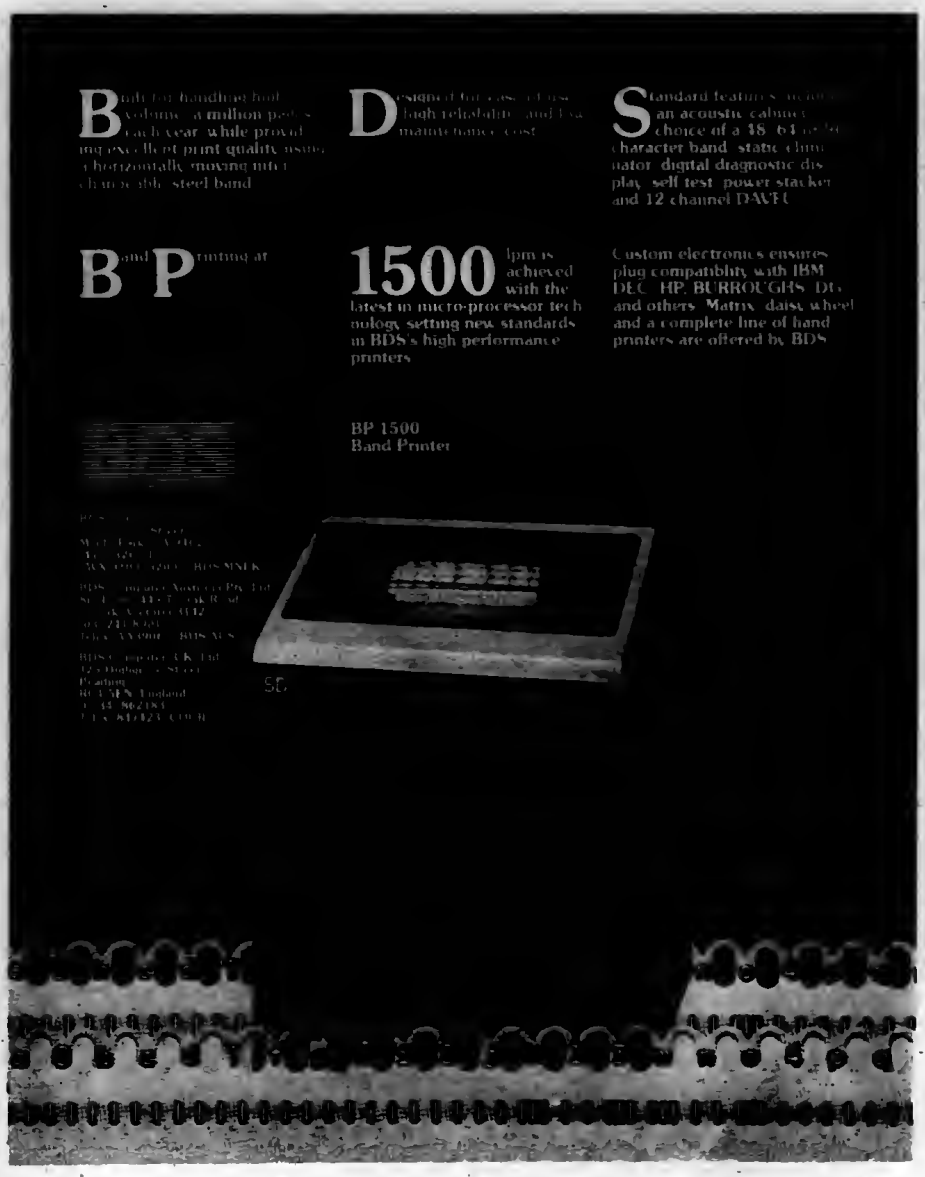
The proposed fiscal year 1983 federal budget includes a total of $43 billion in obligations for the conduct of federal R&D, according to IEEE figures. The NSF budget grew by $72 million, or about 7.5%, to $1.033 billion in fiscal year 1983.

The NSF increase "looks good compared to what's happening in a lot of agencies," remarked Sanderson, who, like Loweth, noted the negative effect of the federal deficit problem on R&D support.

"We've had a constant battle with inflation eating up the increases in R&D," Loweth said. He added that the R&D budget reflects the Reagan administration's decision that the federal government will not support projects it feels are best left to the private sector.

The federal government will concentrate more and more on its own needs, such as defense and air traffic control, according to Loweth, who said that the White House does not find "sufficiently compelling" arguments for government support for "accelerating the introduction of new [nonmilitary] technology."





IBM Predicted to Unveil Local Net, PBX and Replacement for 370s

By Phil Hirsch
CW Washington Bureau

NEW YORK — IBM will unveil a local-area network this year, begin shipping a 370 replacement next year and announce a computerized private branch exchange (PBX) by 1984 at the latest, two veteran observers of the Armonk colossus predicted here last week.

Consultants Dixon Doll and John King also believe that:

• Within the next few years IBM will be offering slow-scan teleconferencing at 9,600 bit/sec over dial-up telephone lines.

• The company's recently announced on-line information network will metamorphose into a remote diagnostic facility for IBM's installed computer base. Later, this facility will capture a market for on-line information offerings designed to compete with AT&T's proposed Advanced Communications Service.

Doll and King said these developments reflect a major shift in IBM's business strategy: Instead of a majority share of a relatively small number of markets — IBM's former goal — the company is now trying to gain a smaller share of all information-related markets.

Doll and King are president and vice-president, respectively, of The DMW Group of Ann Arbor, Mich., a communications consulting firm. In a DMW-sponsored seminar here last week, they said that IBM's basic goal is to raise its revenues and profits above the current 15% annual growth rate.

IBM must quintuple its computer shipments during the next three years to achieve this goal, Doll said. As a result, the company is now working on several improvements designed to increase the user appeal of its Systems Network Architecture (SNA). Among those improvements is a "tremendous push" to develop faster SNA applications generation software, according to Doll. IBM is also working to eliminate redundancies in the present SNA X.25 interface to public data networks, and it is encouraging its competitors to develop SNA interfaces for non-IBM terminals.

Important Changes

Based on recent comments by "the head of the SNA architecture group," King said, these are the changes IBM considers most important:

• Terminal-to-terminal communications capability — peer-to-peer as well as through the network.

• Address expansion, from the present variable 16-bit scheme to a fixed 64-bit format.

• Elimination of duplication/redundancy in the SNA X.25 interface.

• Extended (modulo 128) error-control capability and development of an asynchronous balanced mode SNA option for satellite communications.

• Local-area network support.

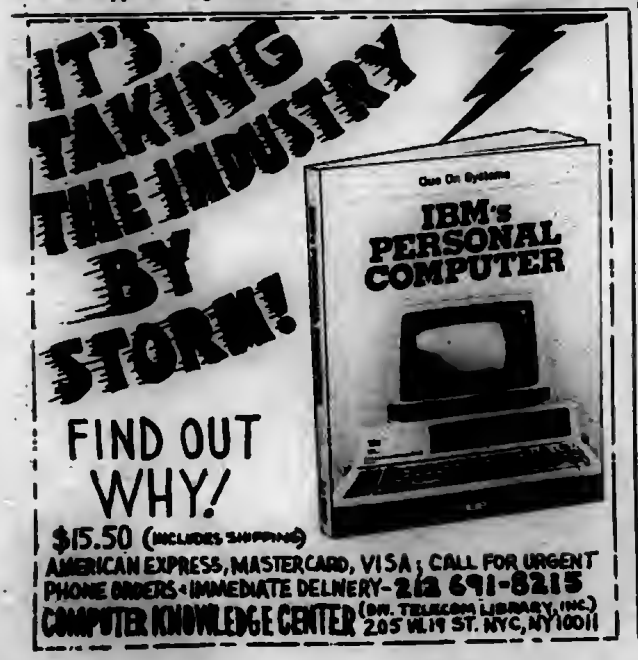
• Better interconnection among multiple, multidomain SNA networks.

• Capability to reconfigure SNA nets by adding and/or deleting terminals, hosts and circuits dynamically.

Even if all these changes are made, SNA is likely to retain some significant shortcomings, said Doll.

Today, because of the large number of SNA networks in place, non-IBM vendors are willing to comply with Armonk's proprietary interface specifications. SNA, as a result, offers the user interconnection with non-IBM devices.

But X.25-based public and private networks are becoming more popular. Today, they are provided by Honeywell/Sesa; Northern Telecom, Inc.; NCR/Comten, Inc.; Tymnet, Inc.; and GTE Telenet Communications, Doll said, "and others are on the way."



Local Net Field Becoming Zoo; Software Shortage To Blame, Engineer Says

By Jeffry Beeler
CW West Coast Bureau

POMONA, Calif. — The local networking field has become a "zoo" where software is in acutely short supply and where the growth of incompatible product lines continues unchecked, according to an engineer with a Southern California peripherals supplier.

Although still a relatively new phenomenon, the local networking business has already attracted more than 40 vendors, most of which have their own peculiar communications protocols and access methods.

The resulting lack of standardization has subjected user organizations to a "tremendous proliferation of [incompatible] networking schemes," Computer Enhancement Corp.'s Ken Harlan said here during a recent conference.

Few Offerings

To make matters even worse, only a few of the players in the local networking field currently offer applications, protocol or access software. So if a user organization wants to buy one of the 20 local networking systems that made its debut between October 1981 and January, it will almost certainly find itself "deep into the development of [communications] software," according to Harlan.

Harlan, who works as chief engineer for his Costa Mesa, Calif.-based company, made his remarks at "Information Systems in the Eighties," a one-day conference sponsored by California State Polytechnic University.

Although networking schemes like Ethernet have earned considerable publicity, Harlan questioned the wisdom of categorizing the Xerox Corp. concept as a bona fide data communications standard. By the end of last year, Ethernet had found its way into only 45 user installations, half of which are inside Xerox itself, Harland said.

Datapoint Corp., by contrast, currently boasts more than 2,000 installations of its Attached Resource Computer network, far more sites than any other networking vendor, Harlan said.

In other comments, Harlan reiterated the widely held view that personal computers present DP directors with a potentially serious challenge and, therefore, require careful management. Harlan estimated the U.S.' total installed microcomputer base at about 1 million units, half of which are reportedly used in businesses.

The popularity of personal computing, which is reportedly expanding by a whopping 800% annually, stems at least partly from the growing inability of central DP departments to meet their users' needs for new services.

Unwilling to wait months or even years for new applications that often prove ill suited to their intended purpose, users are increasingly taking systems development responsibilities into their own hands.

Although this new-found spirit of applications self-sufficiency undoubtedly yields some benefits, it also has a few drawbacks. One such is the growing tendency among corporate microcomputer users to create personal data bases that remain almost totally independent of a company's central mainframe.

The proliferation of autonomous personal data bases has greatly complicated the task of maintaining information reliability and consistency. How can a corporate DP manager make sure that the contents of a company's central and personal data bases are always exactly the same?

Three Steps

Part of the answer, Harlan said, lies in integrating a company's entire personal computer population — a feat that can be achieved through three steps:

• Selecting a common microcomputer operating system like Digital Research, Inc.'s CP/M or Western Electric Co.'s Unix.

• Installing communications software between an organization's host processor and its various personal computers.

• Providing a protected method for small systems to exchange data either with others of their own kind or with large central mainframes.

Information systems managers who follow these steps stand a good chance of fulfilling their main professional mission — to provide nontechnical end users with limited, controlled access to the corporate data bases that best suit their respective needs, Harlan said.

Keystone Meet Set Aug. 9-12

KEYSTONE, Colo. — The Keystone V conference, to be held here Aug. 9-12, will be devoted to the geographic and utility information management industry.

Leaders in the industry will analyze and discuss automated mapping and facilities management, focusing on the need for a totally integrated and automated mapping system, according to a spokesman.

The conference will be preceded by two seminars. The first is titled "The Basics of Automated Mapping Project," which is an introduction to automated mapping and facilities management.

The other seminar is titled "The Executive Program" and is designed for executives of utilities companies, corporations and government agencies. Registration for each seminar is $200.

The conference itself begins with an opening breakfast and keynote address, followed by panel discussions. The registration fee for the main conference is $350. For more information, contact Glenn E. Montgomery at the Kellog Corp., 5601 South Broadway, Littleton, Colo. 80121.

3274 & 3276 USERS: RAYTHEON SAVES.

ONLY RAYTHEON SAVES YOU UP TO 30%, WITH THE SPECIFIC TERMS YOU NEED NOW.

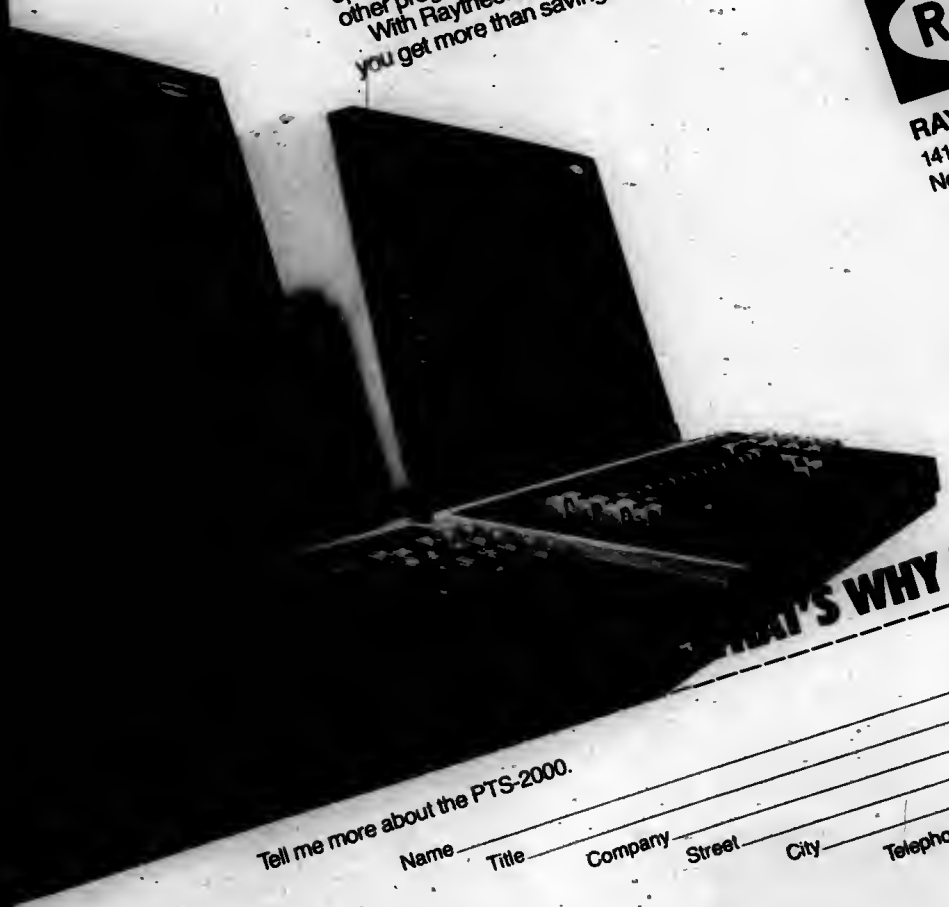
No one can match Raytheon's price advantage in the IBM 3274/3276-compatible terminal market. 30 per cent below IBM. Up to 20 per cent less than other suppliers. But Raytheon gives you even more. We tailor lease or purchase programs to your specific needs, with one-to-five-year terms, purchase options, early termination provisions, and other programs unmatched in the industry.

With Raytheon's PTS-2000 alternative, you get a product rich in expansion and performance features, delivered in 30 days. From Raytheon Data Systems, a division of the $5-billion Raytheon Company. And a worldwide leader in terminals, distributed processing, and word processing by Lexitron.

Find out about Raytheon's PTS-2000, the 3274/3276-compatible terminal alternative. Call 800-343-6676 (in Massachusetts call 617-762-6700 Ext.608) or fill out the coupon for more information.

RAYTHEON

RAYTHEON DATA SYSTEMS
1415 Boston-Providence Turnpike
Norwood, Massachusetts 02062



THAT'S WHY RAYTHEON IS #1*

Tell me more about the PTS-2000.

Name _____ Title _____ Company _____ Street _____ City _____ Telephone _____ State _____ Zip _____

*Among independent 3270-compatible equipment suppliers, according to International Data Corporation.

Exec: Maintenance/Support Not for Junior DPers

By Brad Schultz
CW New York Bureau

CHICAGO — Junior-level programmers should not be assigned to maintenance and support projects, a consultant advised DP professionals here at last week's Access '82 conference.

Junior programmers tend to prefer roles in developing major systems, a session of the conference sponsored by Deltak, Inc. was told by Joseph Izzo, president of The JIA Management Group, Inc. While senior programmers are desirable in any major development project, senior programmers should fill the maintenance/support spots widely considered less glamorous than development positions, Izzo asserted.

Speaking on how to attract and retain DP professionals, the Santa Monica, Calif.-based consultant argued that some senior programmers would be happier as maintenance/support troubleshooters, since they would typically be "patted on the back" every few days in that capacity. This appreciation is craved by such people, Izzo indicated, and lack of it leads many senior programmers to leave employers for other jobs.

On the other hand, junior programmers tend to prefer development work, since it allows them to apply concepts they have learned in school and to establish themselves quickly as professionals contributing significantly to the organization they have joined. Junior programmers are prone to boredom and disappointment when they are assigned to maintenance or support work and denied early opportunities to help develop systems, Izzo declared.

The consultant also said that DP departments commonly neglect short-term projects, requiring a few man-days of work, because long-term projects seem more important. However, short-term projects occupy most of the labor and time in typical DP budgets, he said. Relations with end users would improve if DP departments raised the priorities for such tasks, he declared.

Inaccurate Portrayals

Top managers sometimes form the impression that DP departments are performing poorly when nearly all end users in the organization are actually satisfied with DP services, Izzo continued. This can happen if just a few end users, representing a tiny minority of end users in the organization, complain to a top manager over several days, he explained.

The remedy for such inaccurate portrayals is for top managers to see for themselves how implementations go over, Izzo observed. End users and DP professionals should work more closely together on implementations, he told the session.

The most effective way to reduce turnover is for the DP staff to identify with the organization, making its welfare critical to their personal satisfaction, Izzo said. Other important factors in turnover rate include: competitiveness of salaries and good and consistent personnel policies, he said.

However, a small turnover rate is generally healthy for a DP staff, Izzo noted, because it allows poor workers to leave, good workers to come aboard and may reflect opportunities for career development that encourage some staff members.

One-day STRADIS seminar shows you how to build a better data system.

The key to an effective information system is in defining precisely what you want your system to do before you spend money on design, programming or testing. STRADIS,™ the MCAUTO Structured Analysis and Design methodology, can show you the way. At a STRADIS seminar, we use proven techniques to guide you in setting up a data system geared to your business objectives and requirements—a system that's easy to use, flexible, and quick and economical to change with your needs. In short, a system that delivers for you. To learn more about STRADIS seminars, including dates and locations, contact: W. R. Vickroy, Dept. KR-500, Box 516, St. Louis, MO 63166. Or call (800) 325-1087. In Missouri, call (314) 232-5715.

MCAUTO.
MCDONNELL DOUGLAS
Setting the standard in data processing

MCAUTO is a registered trademark of McDonnell Douglas Automation Company

TERMINALS FROM TRANSNET

PURCHASE PLAN • 12-24 MONTH FULL OWNERSHIP PLAN • 36 MONTH LEASE PLAN

	DESCRIPTION	PURCHASE PRICE	PER MONTH 12 MOS.	24 MOS.	36 MOS.
DEC	LA36 DECwriter II	$1,495	$100	$ 56	$ 40
	LA34 DECwriter IV	895	65	63	55
	LA34 DECwriter IV Forms Ctrl.	1,095	105	65	40
	LA120 DECwriter III KSR	2,295	220	122	85
	LA120 DECwriter III RO	2,095	200	112	75
	VT105 CRT DECscope	1,095	102	60	61
	VT101 CRT DECscope	1,195	110	67	45
	VT125 CRT Graphics	3,295	315	185	110
	VT131 CRT DECscope	1,740	167	95	63
	VT100 CRT DECscope	1,595	150	105	72
	VT100AC Personal Computer Option	2,095	230	120	95
[illegible]	TI745 Portable Terminal	1,695	165	95	55
	TI765 Subsys Memory Terminal	2,695	240	135	93
	TI Model 10 Terminal	995	67	37	25
	TI785 Portable KSR, 120 CPS	2,395	230	128	95
	TI787 Portable KSR, 120 CPS	2,645	273	155	105
	TI810 RO Printer	1,695	165	95	61
	TI820 KSR Printer	2,195	211	117	80
[illegible]	ADM3A CRT Terminal	995	57	34	22
	ADM5 CRT Terminal	645	65	35	24
	ADM31 CRT Terminal	1,195	112	65	42
	ADM42 CRT Terminal	1,995	195	105	72
[illegible]	EXCEL 12 CRT Terminal	1,695	162	95	61
	EXCEL 42 Smart Buffered CRT	995	95	54	35
	COLORSCAN 10 Color CRT	3,195	307	171	115
[illegible]	925 CRT Terminal	995	92	49	31
	950 CRT Terminal	1,675	163	57	39
[illegible]	Letter Quality, 7715 RO	2,995	279	154	154
	Letter Quality, 7725 KSR	3,295	310	175	110
GENERAL ELECTRIC	2030 KSR Printer 30 CPS	1,195	115	67	43
	2195 KSR Printer 120 CPS	2,195	211	117	95
HAZELTINE	Executive 80/30	1,345	127	75	40
	Executive 80/30	1,095	102	56	61
EPSON	MX-80 F/T Printer	745	71	42	27
	MX-100 Printer	995	95	40	55
[illegible]	[illegible] 4 Channel Stat Mux	1,595	147	95	56
	[illegible] 8 Channel Stat Mux	2,095	197	110	74

FULL OWNERSHIP AFTER 12 OR 24 MONTHS • 10% PURCHASE OPTION AFTER 36 MONTHS

MICROCOMPUTERS

ACCESSORIES AND PERIPHERAL EQUIPMENT

ACOUSTIC COUPLERS • MODEMS • THERMAL PAPER • RIBBONS • DIAGNOSTIC MODULES • FLOPPY DISK UNITS

TRANSNET

DP Prodigy Claims College Should Come After On-the-Job Training

By Marcia Blumenthal
CW Staff

SCOTTSDALE, Ariz. — Graduates of computer science programs are not appreciably better at developing automated systems than those who majored in fine arts at college, according to wunderkind Eugene Volokh, a senior consultant for Vesoft Consulting Co.

"College teaches you the answers to questions without telling you the questions," Volokh, a 14-year-old junior at the University of California at Los Angeles (UCLA), recently told a group here attending the executive conference sponsored by International Computer Programs, Inc.

What Volokh advocates — and has indeed practiced — is on-the-job training before formal college study. It is important that would-be systems developers learn what is necessary to create a workable system; college learning is third-hand experience, and most current computer science courses do not teach anything of value, he charged.

As an example, he said that one of the languages he is now learning at school is written for no particular machine, is very complicated and compiles into bad code.

Volokh worked with Hewlett-Packard Co. before entering UCLA. He developed a data protection package for the HP 3000 and worked on the team creating the Multiprocessing Executive program for that system [CW, June 15]

"You cannot understand the needs of the user community without being one of them," he said, noting that the worst products are those developed by those not tuned into the user.

CW Photo by M. Blumenthal
Eugene Volokh

A person can learn the basics of a computer in a few weeks, so years of formalized education on the subject are not necesary, Volokh noted, adding that he wrote programs with very little knowledge of computer science.

The approach college educators should take is, "We will teach you after you know what is necessary"— in other words, after a period of practical education.

The method now used is to teach theory and then to kick the student out in the real world, Volokh said.

NEC's new letter-quality printer gets personal with IBM.

The Spinwriter® 3550 lets the IBM PC get down to business.
NEC's new Spinwriter letter-quality printer is the *only* one plug-compatible with the IBM Personal Computer. So you get the business applications you've been wishing for. Letter-quality output for word and data processing. Multi-language, scientific, and technical printing. Simple forms handling. Quiet operation. And the reliability of the industry's most popular printer line.

NEC designed the new Spinwriter especially for the IBM PC. It comes complete with documentation and training materials to fit your PC user's handbook. Just plug the Spinwriter in and your PC instantly becomes more versatile and flexible.

More than 8 forms handlers and 50 print thimbles boost PC versatility.
NEC designed the Spinwriter's 8 modular forms handlers to accommodate a wide range of paper and document sizes and types. The easily mounted handlers let your computer print out the forms you need for data processing, word processing, graphics, accounting or other business applications.

The Spinwriter's 50 print thimbles can more than triple your PC's usefulness. They come in both constant pitch and proportional-spaced fonts, plus in foreign language, technical and scientific versions. They snap in and out in seconds, and let you print up to 203 columns on 16-inch paper. They each last for more than 30 million impressions.

This printer's special features make everything look better on paper.
The Spinwriter's software-invoked features include automatic proportional spacing; bidirectional, bold and shadow printing; justification; centering; underscoring; and sub/super scripting, all at speeds up to 350 words per minute.

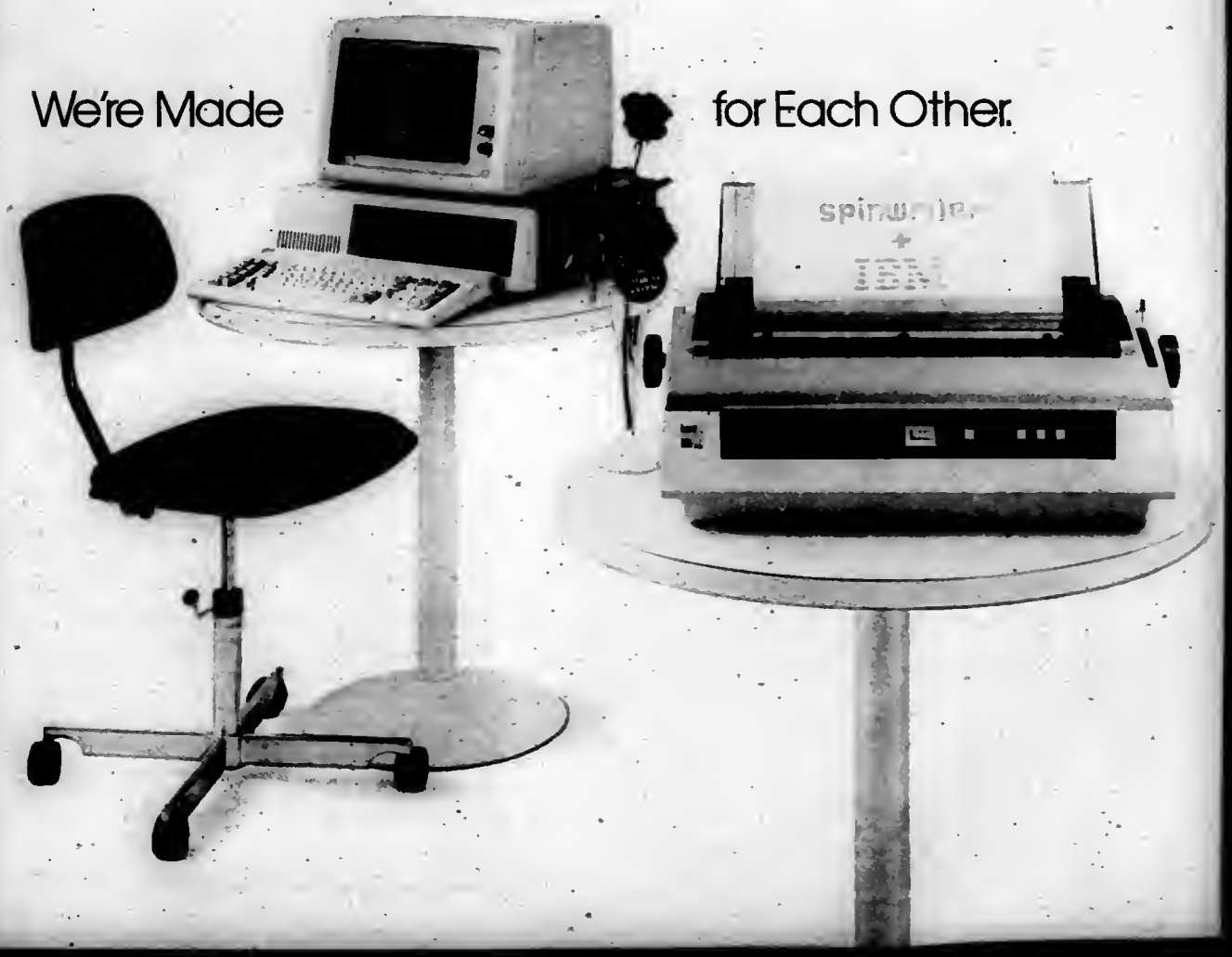
That big extra, Spinwriter reliability.
The new 3550 is part of NEC's renowned Spinwriter family, the world's most popular line of letter-quality printers.

Spinwriters have the industry's best mean-time-between-failure rating, in excess of 3,000 hours. In terms of average personal computer usage, that's more than five years.

NEC Information Systems, Inc.
5 Militia Drive, Lexington, MA 02173
Send me more information on the Spinwriter 3550.

Name
Title
Company
Address
City State Zip

NEC
NEC Information Systems, Inc.



U.S. State Dept. Puts Soviet Roboticist on Hold

By Jeffry Beeler
CW West Coast Bureau

PALO ALTO, Calif. — The federal government has placed in "abeyance" a request by a Soviet robotics expert to visit the U.S. as part of an international technology exchange program, a State Department spokesman said recently.

Nickolay Umnov, a reputed authority on machines that can walk, had originally hoped to arrive in the U.S. on March 2 and stay in the country until early June. But because of a bitter disagreement between the U.S. State Department and at least one of Umnov's would-be hosts, the planned trip has never gotten off the ground.

At the heart of the quarrel was an early State Department attempt to restrict Umnov's professional activities during his three-month U.S. visit. The proposed restrictions drew sharp and almost immediate fire from Stanford University, one of four major U.S. schools the Soviet researcher had asked to visit.

Although the controversy has since been resolved, the planned trip now seems highly unlikely to receive the necessary State Department approval. "Officially, I think [the government and Umnov's prospective hosts] are in complete agreement on everything," according to Stanford mechanical engineering professor Bernard Roth. "But I still don't think the State Department is going to let him come."

Asked to respond to Roth's comments, a government spokesman remained noncommittal. "No disposition has been reached thus far in the Umnov case," according to James Jatras, a foreign service officer with State Department's Office of Soviet Union Affairs. "We're currently in the process of reevaluating the [technology exchange] program to see if there's any difficulty."

Four Universities

Umnov, a researcher with the Moscow-based Institute for Machine Studies, some time ago informed the Soviet Academy of Sciences of his interest in visiting four American universities — Stanford, the University of Wisconsin and Auburn and Ohio State universities.

After reviewing Umnov's request, the Soviet Academy of Sciences forwarded his application to the U.S. National Academy of Sciences, which in turn notified the State Department of the researcher'a interest in visiting. Some time later, Umnov's request to travel to the U.S. was tentatively OKed on the condition that he comply with certain government-imposed restrictions on his activities.

In their original form, the restrictions forbade the Soviet scientist from gaining access to any defense-related research work, either classified or unclassified.

For Stanford, that restriction posed a serious problem because much of the university's robotics research is funded by the military, although none of it is classified. "In effect, the prohibition meant that we could show Umnov almost nothing that has to do with his particular field of interest," Roth said.

The State Department restrictions also barred Umnov from visiting U.S. private industry. "Basically, what we wanted him to do is to confine his professional activities to basic research and not to get into the area of practical robotics applications," Jatras said.

At least one of Umnov's prospective host institutions, Stanford, found the State Department restrictions unacceptable.

"At that point, the National Academy of Sciences stepped into the fray and tried to serve as a mediator," an academy spokesman recalled.

The differences between the two sides were gradually narrowed. The State Department, for example, granted Umnov access to all Stanford's defense-related research work, provided the material was earmarked for eventual publication. "Since practically everything we do here sooner or later finds its way into print, the prohibition was effectively removed," Roth said.

Also amended was the State Department guideline barring Umnov from visiting private industry. Although the basic restriction stands, the revised version relieves host institutions of responsibility for monitoring Umnov's movements, Roth said.

But now that the dispute over the government-imposed restrictions has finally been settled, a new problem has arisen: The State Department recently appears to have placed the Umnov case on the back burner.

ESCAPE from IMS/DL1 to IDMS-1982.

Move your IMS/DL1 applications easily to IDMS-1982.

With ESCAPE, you simply install IDMS-1982 and use your existing IMS/DL1 application code as is. You waste no money on conversion, and you retain your valuable investment in completed code. You then use IDMS-1982 for new applications.

With ESCAPE and IDMS-1982 you get the system some experts said couldn't be done.

IDMS-1982 products include OnLine Application Development, Distributed Database, Integrated Data Dictionary, OnLine Query, OnLine English, Universal Communications Facility, INTERACT, EDP-Auditor, *and* the first relational view of IDMS, the industry's most powerful production database system. Application software includes a General Ledger System, the Cullinane Integrated Manufacturing System, and a Customer Information System for the banking industry. All are or will be fully integrated with IDMS and its related components.

IDMS-1982 products work with IBM 360, 370, 30XX and 43XX computers or plug-compatible equivalents.

Hear more about ESCAPE. Attend an IDMS-1982 Seminar in your area.

Albany, NY, Apr. 15
Ann Arbor, MI, Apr. 20
Asheville, NC, Apr. 27
Atlanta, GA, Apr. 20
Baltimore, MD, Apr. 20
Charleston, SC, Apr. 15
Charlotte, NC, Apr. 13
Cincinnati, OH, Apr. 13
Dallas, TX, Apr. 20
Dayton, OH, May 6
Edmonton, ALT, Apr. 15
Erie, PA, May 4
Ft. Lauderdale, FL, May 4
Ft. Wayne, IN, Apr. 20
Harrisburg, PA, Apr. 27
Houston, TX, Apr. 27
Kingston, ONT, May 11
Kitchener, ONT, Apr. 13
Merrimack, NH, Apr. 22
Milwaukee, WI, Apr. 14
Nashville, TN, May 6
Newport Beach, CA, Apr. 14
New York, NY, Apr. 22
Omaha, NE, May 5
Poughkeepsie, NY, Apr. 14
Quebec City, QUE, Apr. 20
Sacramento, CA, Apr. 28
Saddlebrook, NJ, Apr. 13
Saginaw, MI, May 4
Salt Lake City, UT, May 4
San Antonio, TX, May 6
San Francisco, CA, Apr. 13
Sioux Falls, SD, Apr. 22
Springfield, MA, May 4
Springfield, MO, May 4
Topeka, KS, Apr. 20
Toronto, ONT, Apr. 29
Winnipeg, MAN, May 6

Database Systems

Cullinane
Database Systems, Inc.
400 Blue Hill Drive
Westwood, Mass. 02090
(617) 329-7700
Telex: 200102

Please send me: CW-4/12/82
☐ ESCAPE and IDMS-1982 Information
☐ Information on other seminars at later dates
☐ I'd like to attend your IDMS-1982 Seminar
in _____ (City) on _____ (Date)

Name
Title
Company
Address
City, State, ZIP
Telephone
My computer is
Mail to: Rosalie Cope, Cullinane Database Systems Inc., 400 Blue Hill Drive, Westwood, MA 02090

Database: Cullinane

Carrier Sues AT&T Over Hike in Enfia Fees

NEW YORK — U.S. Transmission Systems (USTS) has filed a treble-damage antitrust suit against AT&T in an effort to block a substantial increase in the fees that USTS and other specialized common carriers pay Bell operating companies for local exchange service.

AT&T and its operating companies announced on Jan. 13 that they would more than double their monthly Exchange Network Facilities for Interchange Access (Enfia) charges. Beginning April 16, the new rate would be about $330/line.

USTS is now paying about $135/line.

Noncarrier customers — business voice and data communications customers — pay $40 to $50/mo for the same facilities.

Not only are the local exchange circuits provided the other common carriers far more expensive, USTS added, but they "are technically inferior to the local services which [Bell operating companies] provide their parent in connection with its competing long-distance service." The allegedly discriminatory rates and unequal service are the basis for the antitrust suit. Damages were not specified.

The present Enfia tariff is scheduled to expire early next month. The Federal Communications Commission is currently considering whether to continue the present rates or raise them.

AT&T Says Enough Data Exists to Authorize ACS

WASHINGTON, D.C. — Competitors of AT&T's proposed Advanced Communications Service (ACS) are trying to "hobble and delay" the offering by filing objections with the Federal Communications Commission (FCC), the phone company said recently in the latest round of an escalating battle over capitalization of XYZ, Inc.

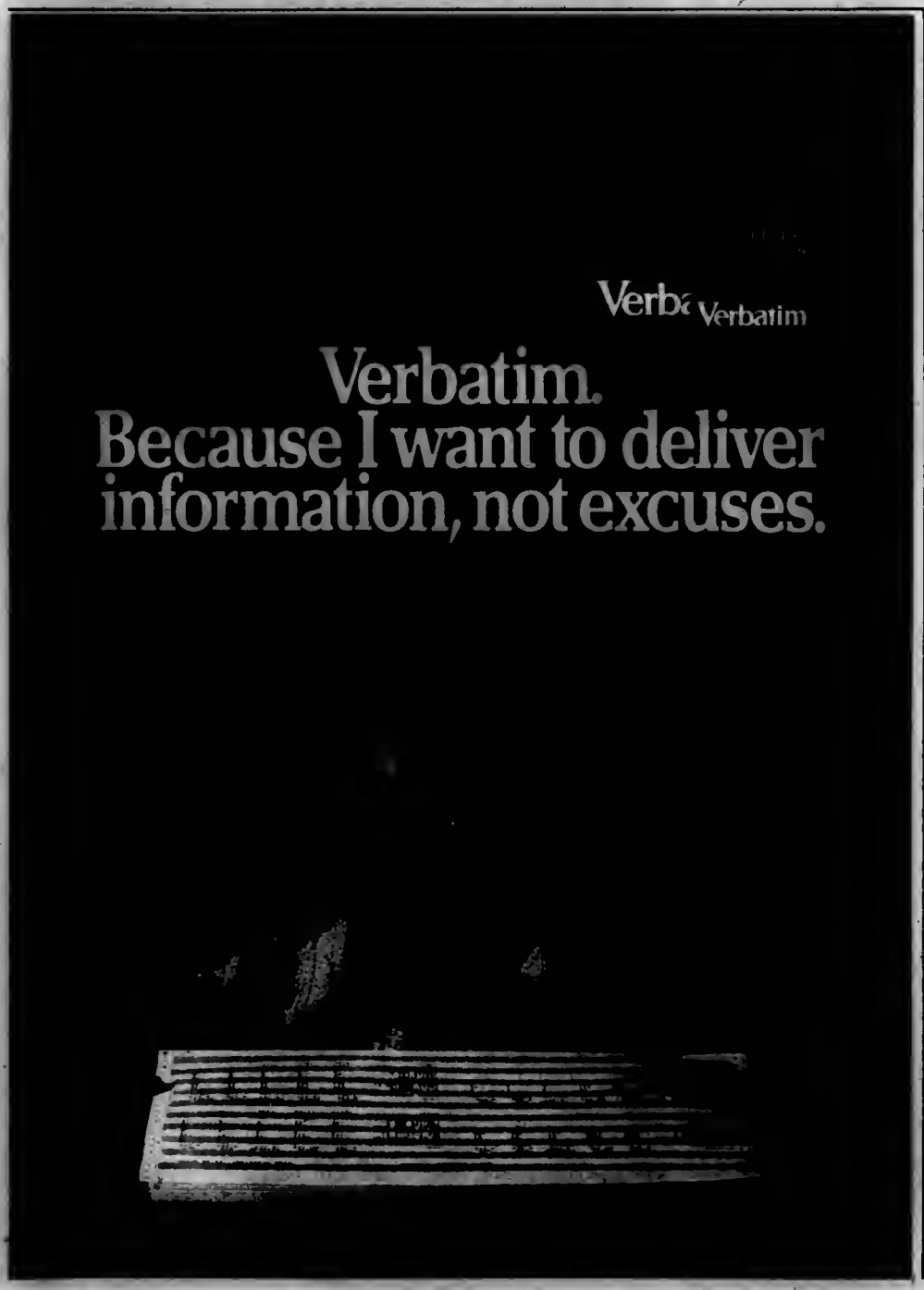
XYZ is the separate subsidiary Bell has organized to offer ACS and other unregulated services; it was established in response to the FCC's Second Computer Inquiry Decision.

"The commission already has before it all of the information [needed] to consider and decide [on] approval of AT&T's capitalization plan," the phone company argued. While prospective competitors of ACS insist the record is incomplete, many of their requests for information are really an attempt "to stretch the scope of this capitalization plan proceeding beyond its intended bounds."

At least two of the objectors — Tymnet, Inc. and the Independent Data Communications Manufacturers Association — have asked for information that "has been or is being provided to the commission," AT&T said.

Fears that XYZ will gain an unfair competitive advantage by having free access to AT&T's deep pockets are misplaced, the company said, because the new subsidiary will "face handicaps resulting from the conditions of separation that larger competitors do not face." For example, the FCC will "control the subsidiary's access to AT&T's financial resources."

However, being an AT&T subsidiary will also have some advantages, as the company indicated when it complained that "certain future competitors would disadvantage the subsidiary by denying it the benefits of the Bell System's consolidated income tax return."



DP DIRECTORY Lists
NY Metro/Tri-State
Users & Vendors

- The Source to a Multi-Billion Dollar Market
- Over 7,000 computer users
- Over 4,000 computer vendors
- Over 11,000 computer executives
- Installed Minicomputers listed
- Installed Microcomputers listed
- Former 500 companies and major non-industrial companies listed
- Company, division, address, contact's name, title, functional area, phone numbers, major hardware installed, major software used, consultants used, applications.
- Index by type of Hardware, Software, & Industries
- 830 pages

Price - $250.000 Order - Mail check to:
Computer Management Research, Inc.
373 Fifth Avenue, Suite 1105
New York, NY 10016
(212) 683-0686

Our new guarantee covers two lifetimes.

A lifetime of performance. All Memorex® disc packs and cartridges are now warranted to be free of defects in material and workmanship and will perform according to read/write capability for as long as they're properly used and maintained. Any product that fails to do so will be repaired or replaced by Memorex. No hassles, no excuses.

A lifetime of service. Secondly, you get a lifetime of technical assistance from Memorex. We'll help you isolate and correct any problems that relate to the operation of our disc packs or cartridges for as long as you use them. It's that simple. To find out more about our new* Comprehensive Guarantee of Satisfaction and Service, call or write: Marketing Manager, Memorex Rigid Media and Components Division, 1125 Memorex Drive MS-0064, Santa Clara, California 95052. Telephone: (408) 987-0267.

MEMOREX
A Burroughs Company

© 1981 MEMOREX CORPORATION. MEMOREX IS A REGISTERED TRADEMARK OF MEMOREX CORPORATION.

*Effective 11/1/81

Because it works.

"Without Epoch 480 computer tape, I couldn't be up here this weekend—I'd be down there in the computer room."

GRAHAM MAGNETICS

Bypassing In-House DP

Firms Seen Going Outside for On-Line Data

By Brad Schultz
CW New York Bureau

PORT CHESTER, N.Y. — More and more, a company will receive on-line information services from outside service bureaus rather than from its DP department, a recent conference here was told.

On-line information services (information utilities) will reach millions of U.S. offices in the 1980s, according to speakers at Information Utilities '82. The DP department will continue to support processing of a company's internal administrative data, but service bureaus will deliver much of the information end users need on conditions outside the firm.

Businesses began subscribing to on-line services in 1970, according to Margaret T. Fisher, who directs the Electronic Information Program of Link Resources Corp., a New York-based market research firm. The most widely marketed category of information sold this way is credit information, she said, followed by financial information.

Although a dozen years old, the market for on-line services has just begun to explode, observed Mark Plakias, director of Link's Videotex Planning Service.

Office Personal Computers

The advent of office-oriented personal computers will largely account for an increase in annual sales of information utilities from $1.6 billion last year to $3.4 billion by 1985, Plakias indicated.

Most offices will use personal computers as workstations, Link President Haines Gaffner predicted, and most office-oriented personal computers will have communications capabilities for engaging information utilities.

For the DP manager, this means less demand from end users for immediate solutions to problems. End users, the Link panelists noted, will obtain these solutions from personal computers at their fingertips — through information utilities, piped in from remote data bases kept by service bureaus, or through applications software packages that run on personal computers.

A number of major U.S. corporations — including AT&T, CBS and the Knight-Ridder newspaper syndicate — are developing videotex-style information utilities for sale to businesses and homes. But Europeans already enjoy a number of on-line services that have yet to reach the U.S., Gaffner pointed out.

The Prestel services, originated by the British Post Office, recently became available in the U.S. These services cost $50/mo plus $12/hour of computer connect-time (a lower connect-time rate is available to packet-net subscribers), according to a Prestel spokeswoman at the conference. "Prestel is a phenomenal success," Gaffner remarked.

During the initial years of on-line information services, the market was vendor-driven, maintained Daniel Miller, director of Link's New Electronic Media Program. That is, the services were foisted on users by vendors that had little detailed knowledge of user wants and needs, Miller explained.

However, the market is now user-driven, Miller and Fisher agreed, and user groups are especially vociferous in alerting vendors to what services are desired by users.

IEEE Recognizes Computer Pioneer With New Award

SAN FRANCISCO — The Institute of Electrical and Electronics Engineers (IEEE) recently presented the first IEEE Computer Pioneer Medal to Jeffrey Chuan Chu, president and chief executive officer of Sanders Technology, Inc. The award was given to Chu in recognition of his early work in electronic computer logic and as a computer pioneer and visionary.

IEEE plans to award the Computer Pioneer Medal annually to individuals who have made contributions, at least 15 years earlier, to the concepts and development of the computer field.

As a research assistant at the Moore School of Electrical Engineering, University of Pennsylvania, Chu was one of the engineers that built Eniac. Chu's responsibilities included designing the first all-electronic arithmetic circuits for the system.

Born in Tiestsin, China, Chu attended the University of Shanghai. After completing his bachelor's degree at the University of Minnesota, he received his master's degree from the University of Pennsylvania.

Before starting his present position at Sanders Technology in 1980, he was a consultant to major corporations and government agencies in the U.S. and abroad.

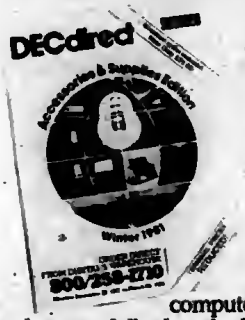
INTRODUCING COMPUTERWORLD/JAPAN
The new newsweekly for the Japanese Computer Community

Computerworld/Japan is *Computerworld's* newest publication covering the world's second largest computer market.
The Japanese EDP market includes 24,311 general purpose computer systems installed, with an installed value of $15.6 Billion. EDP expenditures are expected to grow at 20% per year.
Computerworld/Japan can help you talk to the key buying influences in this large and growing market.
For all details, send in the coupon.

Diana La Muraglia, *Manager, International Marketing Services*
CW COMMUNICATIONS/INC.
375 Cochituate Road, Box 880, Framingham, MA 01701 • (617) 879-0700
Please send me more information on
☐ *Computerworld/Japan* ☐ Your Other Foreign Publications
Name
Title
Company
Address
City State Zip
CW COMMUNICATIONS/INC.
Publishers of Computerworld and other leading computer publications around the world

EasyEntry
Forms management for the PDP-11 and VAX
RSX-11, IAS, RSTS/E, VMS
applied information systems, inc.
500 Eastowne, Chapel Hill, NC 27514
(919) 942-7801

FREE From DIGITAL



Accessories & Supplies Catalog
Spring 1982
Over 1300 items listed

Now you can order all the compatible products for your Digital equipment directly from our warehouse. Our full-color, 128-page catalog offers the complete Digital line—from terminals to personal computers, media to modems, ribbons to floppy disks. And all products are fully described with complete specifications. To order, call our toll-free number today.

Call for our FREE catalog
800-258-1710*
AD CODE: GC

digital

Digital Equipment Corporation, Accessories and Supplies Group, 460 Amherst Street, Nashua, NH 03063. *In NH, AK, HA dial 1-603-884-6660

Can Meetings Be Productive?

Q The director, myself and the three other section managers have a staff meeting once a week. Only once during the last five months has the meeting lasted less than two hours.

Nine out of 10 meetings are a total waste of time. We seem to go in circles and adjourn without deciding anything.

Do other DP departments hold regular staff meetings? If so, with what frequency, for how long and what do they talk about?

A Most DP departments have staff meetings. The frequency varies with the volatility of the department's on-going activities. Weekly staff meetings may be too often, but they are the easiest to schedule.

Consider adopting two fundamental guidelines for future management meetings:

- All five managers should attend each meeting. Cancel and reschedule it if someone cannot make it.
- The meeting should never be longer than one hour. Do not waste time on details that would be more easily resolved by the parties involved.

The content is, of course, dependent on past, current and upcoming problems and issues. Prior to the meeting it is your responsibility to relate to the director any matter that you would like discussed. It is the director's responsibility to plan the meeting and prepare a written agenda. Meetings tend to ramble without a list of topics.

Periodic meetings of the management team are a good idea if properly executed, but they can be a waste of time. A group of busy professionals getting together once a week for a rap session is hard to justify.

Q I switched jobs from a small to a large company in order to obtain experience with large computer systems and data communications. In my 10 years as a programmer I have never been so bored.

What little work I am doing would be considered entry level. I am being compensated for my 10 years experience, but I am treated like a new recruit. Is this typical of large organizations? Can I expect the situation to improve or should I start looking?

A I have received similar feedback from experienced professionals who have accepted employment with other companies. The "old heads" sometimes adopt a more-knowledgeable-than-thou attitude: "Since we know so much and there is so much to learn, we'll bring you along slowly."

This attitude promotes the waste of personnel resources. A 10-year professional has already fought a few fires. If anything, an experienced professional should be treated as a learned stranger and his expertise tapped for new perspectives and insights.

The worst thing you can do with a seasoned professional in a new job is to "bring him along slowly." This is not a good idea for recent college graduates either.

My recommendations to your manager and to any manager hiring an experienced professional is to give these employees the standard company orientation, ask their opinion initially and often thereafter, then throw them to the wolves. Challenges are not only more fun, but they expedite the learning process.

Q My boss, who is the vice-president for business affairs and treasurer of the college, is retiring. I am the director of the computer center and have applied for his job. He is on the search committee for his replacement and for that reason says he cannot write me a letter of recommendation.

I have no cause to believe that there would be any other reason. Do you think his excuse is valid?

A Anyone has the right to refuse to write a letter of recommendation. However, if your manager would have agreed to write a positive recommendation on your behalf to another institution, then he is overreacting to a fairly common situation.

Your resume should list your manager as a reference. If you are deemed a candidate, and if letters are invited from other potential candidates, your manager should respond with a letter to the search committee. A search committee should treat in-house applicants in a similar manner to those from outside the organization.

Long is a professor at Lehigh University, a DP consultant and author. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

If you've got 9,792 pages of important data from your 1981 copies of* Computerworld *and* Computer Business News *buried somewhere —

Computerworld and *Computer Business News* average about 192 pages a week, 51 weeks a year, combined. Each issue has data you can't afford to lose. Special product reports, new product introductions, government regulations, news on contracts, companies, mergers, in-depth reports on new technologies — material you will need all year long. And, as we've learned from answering frantic phone calls in our editorial departments, when you need information on stories we've run, you need it right away.

With the *Computerworld* and *Computer Business News* Indexes, you can put your hands on thousands of major headings, minor headings and individual entries. They cover everything from ACCOUNTING SYSTEMS (86 entries) to ZEUS II SYSTEMS (1 entry) in *Computerworld* and from ACQUISITIONS AND MERGERS (64 entries) to Z-LAB SYSTEM (1 entry) in *Computer Business News*. Look at some of these headings:

Index	*Heading*	*# Entries*
CBN	ACCOUNTING SYSTEMS	77
CBN	COMMUNICATIONS	33
CBN	DISK EQUIPMENT	173
CBN	GRAPHICS SYSTEMS	137
CBN	MICROCOMPUTERS	83
CW	DATA ENTRY SYSTEMS	20
CW	LITIGATION	97
CW	MAINTENANCE	25
CW	SOFTWARE PACKAGES	65
CW	TAPE EQUIPMENT	30

And that's just a small sample of the type of information you'll find in these two books for just one year! We also have Indexes for *Computerworld* that go all the way back to 1976. CBN's first Index is available, and it's a combined issue for 2 months in 1978 (when CBN first appeared) and all of 1980.

If you don't have all the back issues of *Computerworld* and *Computer Business News* that you need to get the articles you want, you can order back copies for an entire year on 35 mm microform from University Microfilm, Int. at very reasonable rates. Or you can simply take advantage of their reprint service for individual articles. (More information is found right in the Indexes themselves.)

MAIL THIS ORDER FORM TODAY!
MAIL TO: CW/CBN Indexes, Circulation Dept., 375 Cochituate Rd., Box 880, Framingham, MA 01701

Please send me the following Indexes:

Year	Index	Price	Quantity	Total $
1981	Computerworld	$ 35.00	____	____
1981	Computer Business News	$ 35.00	____	____
1980 thru 1978	Computer Business News (in one book)	$ 45.00	____	____
1980	Computerworld	$ 30.00	____	____
1979	Computerworld	$ 25.00	____	____
1978	Computerworld	$ 20.00	____	____
1977	Computerworld	$ 20.00	____	____
1976	(last half) CW	$ 15.00	____	____
All Computerworld Indexes		$100.00	____	____

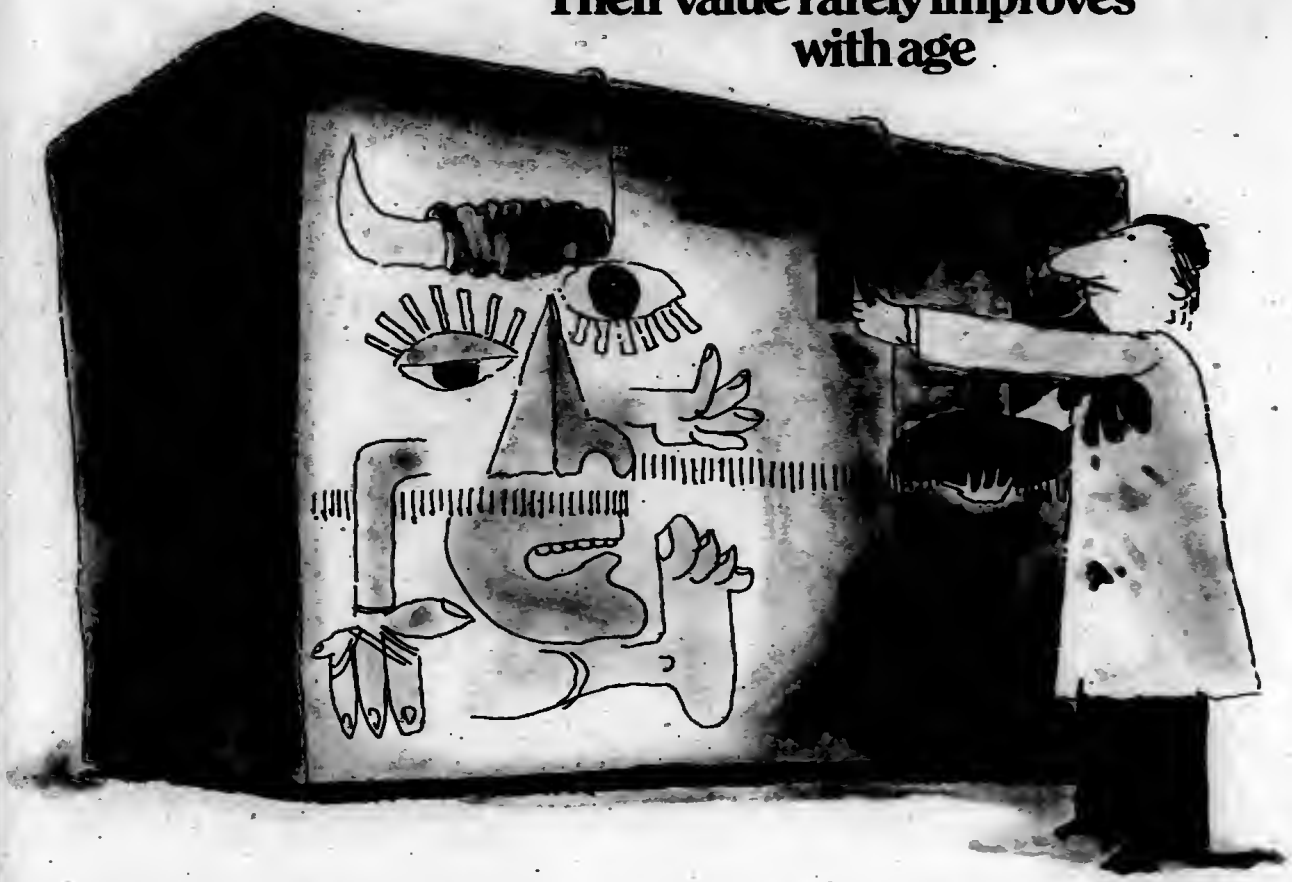
Add $1.25 shipping and handling for one book and 75¢ for each additional book. (If your check is enclosed on you shipping cost.
Total cost

☐ Check enclosed ☐ MC Expiration Date ____
☐ BA/Visa (MC only — list four digits above your name)

If a charge, we need your signature ____
Name ____
Firm ____
Street ____
City ____ State ____ Zip ____

Some data base management systems are like some modern works of art.

Their value rarely improves with age



Some data base management systems look good when you first buy them, but soon seem out of place in a continually changing corporate environment. What was once an avant garde approach to online data management looks old fashioned in today's world of distributed data bases and multi-node computer networks. And because of their highly complex and inflexible designs, only a few highly specialized people are capable of understanding them.

ADABAS from Software AG is the data base management system designed for the 80's and beyond. It offers a unique combination of state-of-the-art relational-like architecture, a full complement of application development and system maintenance tools, and a user friendly operating environment.

ADABAS is ideally suited to helping organizations make the transition from centralized to distributed data processing. It assures fast system development when applications are written using NATURAL, Software AG's productivity-oriented development language. It provides fingertip information access through built-in capabilities such as online inquiry and report writers. Its simplified design increases staff productivity since no personnel must be dedicated solely to data base support. It assures accurate results with an online data dictionary. And its value continually increases because Software AG is committed to maintaining state-of-the-art system software.

If you're looking for a contemporary solution to your data base management problems look closely at ADABAS for your IBM processor or ADABAS-M for VAX/PDP-11s. Use the coupon to arrange for a showing, or to attend a management seminar.

Software AG of North America, Inc.
11800 Sunrise Valley Drive
Reston, Virginia 22091
(703) 860-5050

☐ I would like to arrange for a showing of ADABAS. Please send information.

☐ Please send information on ADABAS-M for VAX/PDP-11s

☐ Please send information on your free DBMS seminars

Name _____

Title _____

Company _____

Address _____

City _____ State _____

Zip Code _____ Telephone (____) _____

CPO _____ Operating System _____

CW 0412

SOFTWARE AG
OF NORTH AMERICA, INC

The Personal Mainframe.

When you use a DECsystem-10 or DECSYSTEM-20, you're using a sytem so versatile and easy to manage that we call it The Personal Mainframe™ computer.

Unlike other large-scale computers, The Personal Mainframe is designed to be interactive. So up to 512 users can run different applications, each with access to the full power of the system.

Engineers can do computer modelling. Scientists can analyze research data. Personnel can run batch payroll jobs. Accountants can do large-scale financial work. And all the while, programmers can work at high-speed video terminals, developing new applications in full-featured mainframe COBOL, FORTRAN, APL, BASIC, or ALGOL. And working with tools like our CODASYL DBMS.

It's this versatility that has made The Personal Mainframe computer so popular for everything from manufacturing, engineering and laboratory work, to government, business and education.

And The Personal Mainframe is very easy to manage.

The DECsystem-10, for example, can provide automatic availability and network status reports every few minutes.

And the DECSYSTEM-20 features our new Bias Control, which balances the CPU dynamically—according to your administrative plan—for interactive, compute-bound and batch operations.

Whichever Personal Mainframe you choose, you get Digital's advanced communications. And the ability to network with other computers from Digital, plus computers from other vendors.

If you're spending a lot on large computers, but not getting enough in return, send for our brochure, "The Personal Mainframe and how to know if you need it." Or call us at 617-467-6434.

And discover just how much a large-scale computer can do.

Digital Equipment Corporation, 201 Forest St., Marlboro, MA 01752. European Headquarters: 12 Av. des Morgines, CH-1213 Petit-Lancy/Geneva. In Canada: Digital Equipment of Canada, Ltd.

digital

We change the way people work.

NMA Annual Conference Set for St. Louis, May 3-6

ST. LOUIS — The National Micrographics Association (NMA) will hold its annual conference here May 3-6.

The conference will address the state of the art in interfacing micrographics, computers and word processing systems. Expanding automated office systems will also be explored, according to an NMA spokesman.

The theme for the show is "Micrographics: New Importance for the '80s." Three seminars will be offered: "Micrographics in Automated Office Systems," "Automated Input/Output Systems" and "Optical Disk: Information Storage and Retrieval Applications." There will also be concurrent special interest sessions on accounting, banking/finance, engineering, government, insurance and micrographics standards.

The registration fee will range from $200 to $550, depending on the number of seminars and days desired, according to NMA from 8719 Colesville Road, Silver Spring, Md. 20910.

Crime, Finance Seminar Topics; Set for May 3-7

CHICAGO — A seminar on management's responsibility for the prevention and detection of computer crime is scheduled to be held here May 3-4. It will be followed May 6-7 by another seminar on the selection of financial software packages for nontechnical-oriented executives.

Cosponsored by the University of Chicago and Price Waterhouse & Co., the first seminar is designed for executives and financial managers who need to evaluate the adequacy and cost of measures against computer crime.

The registration fee is $495 for the first attendee from each organization and $425 for the second, according to a release.

The second seminar is for financial executives who are not computer-oriented, but must make selections of computer-based financial systems.

The registration fees are the same as for the first seminar, and the price for attending both seminars is $925. More information is available from the University of Chicago Center for Continuing Education, 1307 E. 60th St., Chicago, Ill. 60637.

IF YOU'VE GOT CICS
WE'VE GOT YOUR COURSES

TELTECH...the leader in CICS education has the following CICS COURSES for YOU -

C100	CICS/VS	Concepts and Facilities	April 23 NYC
C202	CICS/VS	Command Level Programming	May 10-14 NYC
C106	CICS/VS	System Design Concepts	May 25-28 NYC
C210	CICS/VS/DMS	Design and Programming	May 03-07 NYC

for registration and information, call:

TelTech at (212) 921-0250
Telecommunications Technology Corp.
548 Fifth Avenue, New York, N.Y. 10036

Get Graphics On Your TI Silent 700*

TEXPLOT™ upgrades your TI *Silent 700* terminals to print dot addressable graphics with full DISSPLA** or TELL-A-GRAF** or DEC*** software compatibility.

- simple installation, plug-in module
- 125 dot per inch resolution
- prints 136 or 80 text columns
- very low cost

Available now from Texprint or TI distributors.

*Registered trademark of Texas Instrument, Inc
**Registered trademark of ISSCO
***Registered trademark of Digital Equipment Corp

TEXPRINT

A NOTE TO ADVERTISERS:

HOW TO REACH COMPUTER PEOPLE WHO DON'T GO TO NCC:

Each week, more than half a million computer-involved people read Computerworld for the news they need to stay ahead of a rapidly changing industry. Most of these people do NOT go to the National Computer Conference (NCC attendance in 1982 is expected to reach 70,000). But they DO need to know what's going on at America's greatest computer show. The way they find out is with Computerworld's Preview and Wrap-Up issues.

THE PREVIEW ISSUE

gives Computerworld readers information on everything that's about to happen, and comes out on May 31st. The color close is May 14th; black and white close is May 21st.

THE WRAP-UP ISSUE

is just that; a look at everything that happened at NCC, new products on the market, important events, etc. And the Wrap-up Issue comes out June 14th. The color close is May 28th; black and white close is June 4th.

AND HOW ABOUT ALL THOSE PEOPLE AT THE SHOW

They're also important people in the computer world, and people you want to talk to. For that purpose we recommend our popular NCC Show Issue and our combined CW/CBN NCC Daily, which is printed and distributed to hotels in Houston every day of the show.

For all the details on any of these issues, contact your local Computerworld salesperson.
Or, to reserve ad space, call Frank Collins at (617) 879-0700.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

BOSTON / Chris Lee, Ed Marecki, Joe Fitzhugh, Kathy Doyle, Diane Sukey, (617) 879-0700
CHICAGO / Dave Dolber, Newt Barrett, Jan Raska, Chris Lee, (312) 827-4433
NEW YORK / Mike Masters, Peter Senft, Doug Cheney, Ray Corbin, Fred LoSapio, (201) 967-1350
SAN FRANCISCO / Bill Healey, Barry Milione, Ruth Gordon, Eileen Dunn, (415) 421-7330
LOS ANGELES / Jim Richardson, Bob Hubbard, Beverly Raus, Debra Pendergrass (714) 556-6480

Plus Two Seminars

Dema Schedules Miniconference

MINNEAPOLIS — The Data Entry Management Association (Dema) will sponsor a miniconference and two professional growth seminars here on June 14-16.

The miniconference includes problem-solving workshops for data entry managers and first line supervisors for improving supervisory skills and management techniques.

Seminar A will focus on Japanese management methods for data entry departments and methods for increasing productivity and management techniques.

Seminar B, designed for lead operators and supervisors, will focus on such topics as motivation, absenteeism, turnover, managment reporting and forms design.

Tuition fees include supplies, luncheons and cocktail receptions.

The fee for the miniconference only is $225 for Dema members and $265 for nonmembers. The fee to attend one seminar is $275 for members and $315 for nonmembers.

The cost to attend one seminar and the conference is $435 for members and $475 for nonmembers.

Dema can be reached at P.O. Box 3231, Stamford, Conn. 06905.

Training Series Out for SPF Users Of MVS Systems

OAK BROOK, Ill. — A multimedia training series for programmers using System Productivity Facility (SPF) software running under IBM's MVS operating system is available from Deltak, Inc.

The training is recommended for project leaders and others working with SPF programs and libraries. The self-instruction program reportedly offers a general overview of SPF and its features, including instruction on how to set SPF parameters for user identifications, use the SPF Tutorial facility, allocate new data sets and create and store new files. It also explains the process of submitting jobs for foreground and background processing, the vendor said.

The SPF/MVS series is available for purchase or rental through Deltak's Deltavision Library Plan. Courses rent from $50 to $125 each/mo, depending on volume. Deltak is located at 1220 Kensington Road, Oak Brook, Ill. 60521.

Free Brochures

• "Quality Circles: Answers to 100 Frequently Asked Questions" booklet introduces the Quality Circle Institute management personnel and describes its Japanese and U.S. history, objectives, organization, implementation and techniques. It can be obtained from the Quality Circle Institute, 1425 Vista Way, Airport Industrial Park, P.O. Box Q, Red Bluff, Calif. 96080.

• "The Systems Development Life Cycle," a four-color wall chart, outlines systems development concepts. Requests should be directed to Donald R. Goodman, Manager-Marketing Services, Atlantic Management Systems, Inc., 320 Walnut St., Philadelphia, Pa. 19106.

'Panaudit' Course Offered

OAK BROOK, Ill. — A multimedia training course for Pansophic Systems, Inc.'s Panaudit software package, designed for nondata processing auditors, is now available.

The course is said to teach auditors how to integrate the package into the audit process, code and run a Panaudit program and interpret and verify processing results.

Course materials include two videotapes, two student workbooks and a Panaudit reference manual, according to a company spokesman.

Priced at $3,500, the course can be obtained from Pansophic Systems, 709 Enterprise Drive, Oak Brook, Ill. 60521, or from a local sales representative.

There are
free
IBM 3270 terminals
hidden
in this box.

Calendar

May 3-6, New York — **Basic Project Management: Planning Scheduling and Control.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

May 3-7, Boston — **Auditing in the Contemporary Center.** Contact: DP Auditors Association, Inc., New England Chapter, P.O. Box 516, Boston, Mass. 02101.

May 3-7, Tampa, Fla. — **Structured Systems Design/ Structured Requirements Definition Combined Course.** Contact: Jim Highsmith, Ken Orr and Associates, Inc., 715 E. 8th, Topeka, Kan. 66607.

May 3-7, New York — **CICS/VS Command-Level Applications Programming.** Contact: Ilene Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

May 3-7, Teaneck, N.J. — **Systems Design Workshop.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 3-7, Arlington, Texas — **CICS Command-Level Programming.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 3-7, Annapolis, Md. — **How to Establish a Successful DP User Coordination Function.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

May 3-7, Richmond, Va. — **Structured Analysis/Design Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

May 3-7, San Francisco — **Structured Design/Programming Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

May 4-5, Boston — **Computer Graphics for the Communication Arts.** Contact: Elois Wenker, National Computer Graphics Association, 2033 M St. N.W., No. 300, Washington, D.C. 20036.

May 4-5, Boston — **Applications of Computer Graphics to Transportation Problems.** Contact: Elois Wenker, National Computer Graphics Association, 2033 M St. N.W., No. 300, Washington, D.C. 20036.

May 4-6, Detroit — **8th Annual Computer Graphics Conference and Equipment Display.** Contact: Rackham Memorial Building, 100 Farnsworth, Detroit, Mich. 48202.

May 4-7, Jericho, N.Y. — **Computer Associates Training Seminars.** Contact: Computer Associates, Training Seminars, 125 Jericho Tnpk., Jericho, N.Y. 11753.

May 4-7, New York — **Human Relations.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 4-7, Chicago — **Structured Programming: Techniques for Productivity.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 4-7, Seattle — **Structured Requirements Definition.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 4-7, Pittsburgh, Pa. — **Project Management.** Contact: Bill Schoonmaker, BSI, 4720 Montgomery Lane, Bethesda, Md. 20814.

May 5-6, Cary, N.C. — **SAS Color Graphics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

May 5-6, Arlington, Va. — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

May 5-7, Arlington, Va. — **Data Communications Systems.** Contact: Center for Advanced Professional Education, 11928 Earlham, Orange, Calif. 92669.

May 5-7, Los Angeles — **Strategic Planning for Office Automation.** Contact: Advanced Office Concepts Corp., Suite 433, 1 Bala Cynwyd Plaza, Bala Cynwyd, Pa. 19004.

May 5-8, Arlington, Va. — **The Changing Role of the Computer Consultant.** Contact: Independent Computer Consultants Association, P.O. Box 27412, St. Louis, Mo. 63141.

May 6-7, Dallas — **IMS Systems Management.** Contact: Sondra Schwartz, Boole & Babbage, Educational Ser-

(Continued on Page 30)

It's really quite simple.

Our cluster controller looks like a 3270-series cluster controller to your computer.

The Intersil terminals connected to the controller act like IBM 3270-series terminals. But the terminals are actually inexpensive, reliable, ASCII terminals.

And every special function key on a 3270-series terminal has a corresponding special function key on the Intersil terminal.

The smarts for a 3270 are in the box.

In fact, this box is so smart, you can run remote dial-up terminals as well as directly connected terminals. (Up to 16 per cluster!) And the controller will connect to *multiple* IBM host computers.

The Intersil cluster is compatible with standard operating systems.

The savings are in the box, too.

An Intersil controller with eight Intersil terminals costs you about the same as a four-terminal set-up using IBM 3270-series equipment.

The controller is simple and reliable. The terminals are simple and reliable.

Installation and maintenance are, as you would expect, simple and inexpensive—available through the worldwide General Electric maintenance organization.

So you save when you start, and save when you grow. And think about this:

When you want to add a new terminal, you're talking $1500.

You're talking Intersil solutions.

We're making connections. Let's connect. Please call or write for information on Intersil's wide-ranging communications solutions.

Intersil can get all your machines talking.

- ☐ Intersil 3270-style controller/terminal series.
- ☐ Intersil local area networking.
- ☐ Intersil protocol translation systems.
- ☐ Intersil statistical multiplexers.
- ☐ Intersil DEC compatible communications boards.
- ☐ Intersil communications solutions overview.

Name: _____
Company: _____
Address: _____
City: _____
State: _____ Zip: _____
Telephone: _____

Intersil Systems
1275 Hammerwood Ave.
Sunnyvale, CA 94086
(408) 743-4300

INTERSIL SYSTEMS

Calendar

(Continued from Page 29)
vices Division, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

May 6-7, Chicago — **Computer Graphics for the Communication Arts.** Contact: National Computer Graphics Association, 2033 M St. N.W., No. 300, Washington, D.C. 20036.

May 6-7, New York — **CICS/VS Macro-Level Applications Programming.** Contact: Ilene Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

May 6-7, Washington, D.C. — **Managing Engineering Information Resources.** Contact: George Washington University, School of Engineering and Applied Science, Washington, D.C. 20052.

May 6-7, Washington, D.C. — **Securing Communication Systems.** Contact: Computer Security Institute Educational Resource Center, P.O. Box 528, Matawan, N.J. 07747.

May 7-8, Waltham, Mass. — **Computer Law: Structuring and Negotiating Contracts for Hardware, Software and Services.** Contact: Bentley College, Center for Continuing Education, Beaver & Forest St., Waltham, Mass. 02254.

May 10, Boston — **CICS Macro-level Coding.** Contact: Computer Education Services, Inc., 739 Boylston St., Boston, Mass. 02116.

May 10-11, Los Angeles — **Fundamentals of Data Processing and Telecommunications.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403. Also being held in San Francisco, May 10-11.

May 10-11, Washington, D.C. — **DMS/CICS/VS Application Design and Coding.** Contact: Data Base Management, Inc., 281 Hartford Tnpk., Vernon, Conn. 06066.

May 10-11, Chicago — **Human Factors in Office Automation.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 10-11, Pittsburgh, Pa. — **Word Processing Implementation Workshop.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

May 10-12, Washington, D.C. — **Computer-Based Micrographic Retrieval Systems.** Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

May 10-12, Boston — **Data Base Fundamentals.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 10-12, Washington, D.C. — **Strategic Information Systems Planning Executive Forum.** Contact: U.S. Professional Development Institute, 12611 Davan Drive, Silver Spring, Md. 20904.

May 10-12, Andover, Mass. — **Improving Automated Payroll Systems.** Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

May 10-12, Boston — **Project Management.** Contact: Ware Associates, Division of W/A, Inc., 38 Main St., Hudson, Mass. 01749.

May 10-12, Washington, D.C. — **Strategic Information Systems Planning.** Contact: Information Systems Planning, 12611 Davan Drive, Silver Spring, Md. 20904.

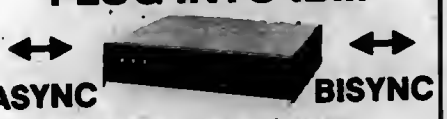
May 10-12, New York — **Computer Control and Audit Course.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 10-12, Montreal, Que. — **Capacity Management Forum.** Contact: Sandra Schwartz, Boole & Babbage, Educational Services Division, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

May 10-12, Boston — **Data Base Fundamentals.** Contact: Q.E.D. Information Sciences, Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 10-13, Andover, Mass.

PLUG INTO IBM



With DataLynx™ Protocol Convertors

DataLynx/3780: a comprehensive batch emulator for remote or host simulation. The DataLynx/3780 can connect async terminals or minicomputers to an IBM bisync host, or an async minicomputer to an IBM bisync peripheral such as the OS6 or 6670 laser printer.

DataLynx/3270: an interactive 3271-2 bisync emulator that supports two async ports configurable as two CRTs or a CRT and printer. The DataLynx/3270 allows dumb CRTs to emulate the IBM 3277-2 CRT. The CRTs may be connected via *dial-up* async modems, giving dial capability to a 3270 network.

Common features:
- Menu-assisted • Data rates to 19.2Kbps
- a Modem eliminator • Two async I/O ports
- 900 LPM printer support
- Emulates 3780, 2780, 2770, 3741 & 3271

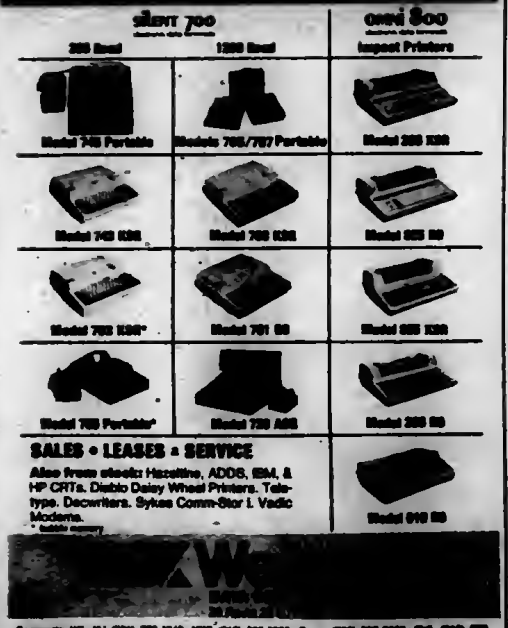
LOCAL DATA

2701 Toledo St., Suite 706
Torrance, CA 90503

TELEX #182518
Phone: (213) 320-7126

TEXAS INSTRUMENTS TERMINALS IN STOCK IMMEDIATE DELIVERY

AUTHORIZED DISTRIBUTOR
TEXAS INSTRUMENTS DATA TERMINALS



PDP-11 & VAX users...

ComDesign's TC-3 Concentrates Multiple Terminals Over One Phone Line . . . Without a DZ11!

- COST SAVINGS TO 90% — Totally eliminates DZ11s, extra modems and phone lines
- STATISTICAL MULTIPLEXING — Up to eight 9600 bps terminals over 1 phone line
- ERROR CORRECTION — Phone line errors eliminated automatically.
- PROVEN RELIABILITY — Over 3 years MTBF.
- FAST ECHO RESPONSE
- CONCENTRATION — Multiple terminals—one line.
- COMPLETELY TRANSPARENT — No software changes needed.
- BUILT-IN SYSTEM MONITORS — Real-time data and signal displays, statistics and error counters.
- POWERFUL DIAGNOSTIC PANEL — Modem loop-back, unit self-tests, and terminal diagnostics

Only $840/mo. for a TC-3 . . . Connect 8 Terminals on 1 Phone Line, Without a DZ11.

For further information and the sales office for your area call toll-free (800) 235-6935 or in California (805) 964-9852

ComDesign

ComDesign, Inc.
751 South Kellogg Avenue
Goleta, California 93117

* Registered Trademarks of DEC

TONE 3

TONE

Calendar

— **Computer-Based Order Processing, Credit & Receivables Systems.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

May 10-13, Piscataway, N.J. — **CICS/VS Testing & Debugging.** Contact: Ilene Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

May 10-14, Chestnut Hill, Mass. — **Systems Analysis/Systems Design.** Contact: The Datamation Institute for Information Management & Technology, Seminar Coordination Office, Suite 415, 850 Boylston St., Chestnut Hill, Mass. 02167.

May 10-14, Arlington, Va. — **Systems Analysis Workshop.** Contact: Q.E.D. Information Sciences, Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 10-14, Portland, Ore. — **Structured Requirements Definition.** Contact: Jim Highsmith, Ken Orr and Associates, Inc., 715 E. 8th, Topeka, Kan. 66607.

May 10-14, Pittsburgh, Pa. — **Project Management.** Contact: Bill Schoonmaker, BSI, 4720 Montgomery Lane, Bethesda, Md. 20814.

May 10-14, Fort Wayne, Ind. — **Structured Analysis Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

May 10-14, Andover, Mass. — **Structured Systems Analysis and Design.** Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

May 10-14, Cleveland, Ohio — **Structured Design Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

May 10-14, New York — **Structured Analysis/Design Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011. Also being held in Minneapolis, May 10-14.

May 10-14, Los Angeles — **8100 DPPX Application Analysis and Design.** Contact: Data Base Management, Inc., 281 Hartford Tnpk., Vernon, Conn. 06066.

May 10-14, San Francisco — **Software Maintenance: Tools, Techniques and Management Strategies.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

May 10-14, New York — **CICS/VS Macro-Level Applications Programming.** Contact: Ilene Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

May 12-13, Houston — **SAS Basics Course.** Contact: SAS Institute Inc., P.O. Box 8000, Cary, N.C. 27511.

May 12-14, Washington, D.C. — **DMS/CICS/VS Advanced Topics.** Contact: Data Base Management, Inc., 281 Hartford Tnpk., Vernon, Conn. 06066.

All U.S. Sales/Use Tax Rates on magnetic tape...

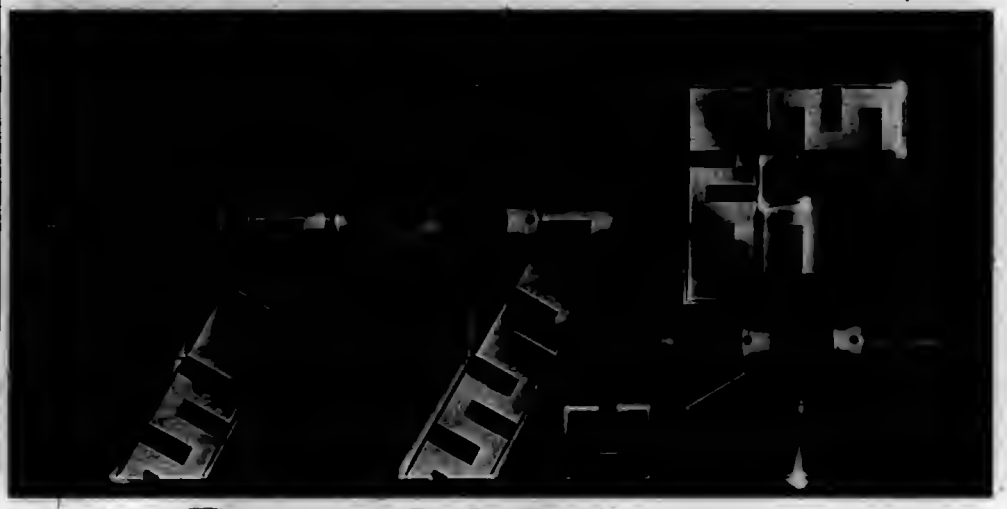
Vertex Systems Inc.
[illegible]
215-687-[illegible]

CICS BOOK

INCREASE YOUR VALUE to your employer or clients. This book, "INTRODUCTION TO CICS PROGRAMMING"

- takes the mystery out of CICS
- develops a Command Level COBOL application using a "cookbook" approach
- illustrates CICS tables, VSAM/AMS, and BMS

To order, send $29.95 (add $1.50 tax in MD) to:
MV Associates
P.O. Box 4157, Chevy Chase, MD 20815



Data 99.5% pure.

Now digital data communication of guaranteed accuracy and unprecedented reliability is available in more than 350 cities.

It is DATAPHONE® Digital Service, a major development of the Bell network, the world's largest and most advanced information management system.

With DATAPHONE Digital Service, your data system handles more data, clean data, day in and day out. Bell guarantees better than 99.5% error-free seconds transmitting at 56,000 bps and even greater accuracy at slower rates. Reliability is designed in. If needed, troubleshooting and service are handled quickly by the Bell System from a central location. You get more use from your system without adding costly hardware.

When your system is digital from end to end, there are no losses of quality due to signal conversion or amplification. Re-transmission is virtually eliminated.

You'll find that when your data system is more efficient, accurate and reliable, you can respond faster, serve your customers and users better, manage better.

Discuss with Bell how DATAPHONE Digital Service can serve your needs. All you have to do is call toll free 1-800-821-2121. In Missouri, call 1-800-892-2121. **1-800-821-2121**

Put our knowledge to work for your business. Bell System.

The knowledge business

EDITORIAL

In Whose Interest?

The deputy director of the Central Intelligence Agency, Adm. B.R. Inman, has not been very successful in proving that open publication of scientific research results poses a danger to national security. He has persuaded few, if any, that there should be government review of computer hardware, software and other electronics research prior to publication.

But Inman has probably accomplished exactly what he wanted: He has provoked a national debate over what he would like us to think are competing interests — an open society and national security.

Let's look at exactly what he has done. First, Inman told the American Association for the Advancement of Science (AAAS) in January that open scientific publication threatens national security. Then, under sharp congressional questioning, he admitted that the "proof" may not be all that conclusive. There really is no big problem now, but there may be in the future, he said, explaining that he is just trying to warn his friends in academia about a possible backlash of public opinion, not threaten them with government censorship. Finally, he protested he was speaking only as a private citizen and was not proposing any government action at all.

Excuse us if we are not terribly reassured. Putting aside the obvious threat to basic First Amendment freedoms in the admiral's comments — freedoms which we in the newspaper business are pretty touchy about — let's consider what this whole flap about openness vs. national security has produced.

The current government review procedure for cryptography research was set up by academia on unsubstantiated intelligence community claims that there was an imbalance between freedom to publish those findings and national security. Now the intelligence folks want to extend that kind of thinking to numerous other areas of science and technology.

Inman told the AAAS there is a need to find "a workable and just balance" between "technical information and national security." With no convincing evidence, he has gotten everyone thinking that constitutional rights and national security are competing interests requiring constant government tinkering to keep balanced.

We cannot concede that there is any natural "tension" between openness and security, as Inman would have us believe, and we refuse to accept that we have to justify our rights to the spooks at the CIA.

We applaud Inman when he says we must protect the nation. But when he says we must "simultaneously . . . protect the individual rights of scientists — both as academics and citizens," we are moved to remark that Inman and his kind of thinking are currently the biggest threats to those rights.

DATA PAST

Five Years Ago
April 25, 1977

HOUSTON — Magnetic bubble memories found their first commercial application in the computer industry, but not in a multimillion dollar mainframe.

Texas Instruments, Inc. integrated the mass memory storage medium into two automatic send/receive versions of its Silent 700 series terminals after a three-year laboratory effort.

These consisted of the TI 765 portable memory terminal and the Model 763 memory send/receive.

Ten Years Ago
April 12, 1972

LOUISVILLE, Colo. — Storage Technology Corp. introduced a series of magnetic tape systems, compatible with IBM computer systems, that could read and write standard magnetic tape at a recording density of 3,200 bit/in.

Reportedly twice the density offered by any other company, the 3,200 bit/in. density could be achieved, the company said, with most of the then-manufactured tapes that used a heavy-duty binder.

LETTERS

Old Problems, Old Solutions

The editorial "Not a Pretty Picture" [CW, March 15] certainly is accurate, but it isn't news. The problems cited have been around as long as I have, which is as long as the computer has been around in business use.

Computerworld cites these as:

- Aging, obsolescent software.
- Impossible backlogs with priorities set elsewhere and user "steering" committees.
- Alienation from the management decision-making process.
- Poor end-user relations.

There exists a small but growing "cult" that has long been propagating the solution to these problems and it is very simple: Move the DP activity from under the aegis of the various functional structures under which it disadvantageously reports — accounting, administration, manufacturing and so on. Elevate DP to an across-the-board functional parity with those others that traditionally report to the chief operating manager.

This single reorganizational strategy will eliminate all of the above noted problems either directly or indirectly by allowing DP to function the same as any functional organization does in the delivery of its specialty (whether that peer is engineering, accounting, personnel and industrial relations, manufacturing or marketing).

Under this arrangement, DP becomes master of its own destiny, and its right to succeed is affirmed.

One of the oldest tenets of management theory is that responsibility flows up, authority down and that one never, never be held responsible without a corresponding level of authority. Simple, isn't it?.

One more problem area that your editorial overlooks is career path obstruction. DPers are not by nature or training able to progress through the financial function to higher management.

They are not historians; they are innovators and engineers.

Tom O'Connor
Nashua, N.H.

Refreshing Change

Werner L. Frank's articles in *Computerworld* have been very refreshing.

It is a change to find someone writing sensibly about software instead of touting some pet panacea such as structured programming or APL.

"Data Management Systems: Focusing on the User" [CW, March 15] was excellent, with its appreciation that a user needs to be able to manipulate the subfiles extracted from a data base, not merely print data listings.

An earlier article on the need to prototype or experiment with systems before setting specifications and documentation in cement was also good.

A user does not know what he needs until he has tried the system out. I have been building software systems for my own use for 10 years and still improve them from time to time, and I have over 35 years experience in my profession.

I hope *Computerworld* will keep plugging the need for flexibility and consideration of the user's needs.

William A. Bryden
Golden, Colo.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 709 FRAMINGHAM, MA 01701

postage will be paid by

CIRCULATION DEPARTMENT

COMPUTERWORLD

375 Cochituate Road, Rte. 30
Box 880
Framingham, MA 01701-9985

Detach here, moisten and seal envelope securely before mailing.

Fold and insert order form (attached through binding) and remittance here.

SOFTLINE/Werner L. Frank‡

Software Inspections: Process and Payoffs

In a prior column we discussed the use of the inspection process in developing applications software [CW, March 29]. Now we turn to the procedure itself and conclude with the principal benefits that can be achieved.

To be effective as a formal procedure, the inspection must be implemented in a properly prepared, receptive environment. The prerequisites for preparing this environment are commitment, standards, methodology and tools.

Management commitment is fundamental to installing the inspection process. There must be the desire to produce better software in a more organized fashion, accompanied by a willingness to try new and more formal techniques.

Besides this fundamental philosophical commitment, success in using inspections requires both managers and programmers to be aware of the various demands that will be placed on the project. These include:

- A commitment to writing and approving designs before coding. Writing down ideas may take a lot of time.
- A commitment of the time of several team members, sufficient to review software and participate in meetings.
- A substantial commitment of the moderator's time to conduct the inspection and supervise rework.
- A commitment that specific software, certain programmers or selected development stages (code only) are not "singled out," but are all included in inspections.
- A commitment to writing down all inspection results, problem reports, statistics and so on.
- A commitment to scheduling and performing the rework of software or a design, even if it represents a delay in the project.

The next requirement for successful inspections is the identification of standards.

Software designs and code cannot be formally inspected or reviewed without reference to basic standards. The standards represent the discriminating measure of acceptable and unacceptable design and programming practices.

Standards can also serve the extremely vital purpose of insuring that the development process is not reduced to simply generating compilable code.

Better Standards

In practice, inspection efficiency improves greatly with better and more detailed standards. Many discussions will not be necessary. Many differences of opinion can be resolved or at least identified as being subjective. Issues of form and style, very critical to subsequent ease of maintenance, are simplified and become much easier to resolve. The whole process works faster, and more acceptable software will be produced before the inspection starts.

A development methodology is also vital to inspection success. When inspections are used on a project that is developing new software or modifying portions of old software, the development process must be followed step by step. Design inspections will be ineffective if the materials are not sufficiently detailed or if coding has already been done. Code inspections will become frustrating if design-related problems are still unsolved.

Software must be inspected in an orderly fashion at its various stages of development. This becomes an indispensable requirement for effective inspections.

From another viewpoint, the inspections can be the driving force to sequence properly the steps of development. If inspections are held at several stages (goals, preliminary design, code), then written materials must be produced at each such stage and the software design and implementation must therefore pass through these stages. This development methodology is thus intimately connected to the inspection sequence that drives the process through "exit criteria" from one project stage to the next.

Adequate Tools

Finally, inspections must be conducted with adequate tools. Inspections are not reviews held on the spur of the moment or spot-checks of a staff member's work. To be effective and efficient at locating and correcting problems, three types of tools are utilized to shape and define the procedures in a "customized" manner on any project.

These tools are: the criteria for inspection materials, the various checklists and the recording of data and statistical analysis of results. Before implementing inspections, managers and staff members should refine these tools for their particular projects.

The criteria for inspection materials specify what the author is to prepare for an inspection and what will be expected in order to pass the inspection. These are the so-called entry and exit criteria. The materials to be inspected should be specified in as much detail as is needed to avoid any confusion on the part of the team.

The criteria for materials are different for each of the goals, preliminary design and code inspection phases. The criteria for each phase include: a statement of the purpose of the inspection, prerequisites for initiation of the inspection step, a description of the format or outline to be used to convey the information and a list of materials to be inspected at the meetings.

Each inspection phase has certain general requirements that apply to any application. These are identified in the baseline criteria for the materials needed for each phase. In addition, the criteria for materials for each stage should also describe any specialized requirements tailored to

(Continued on Page 36)

HUMAN CONNECTION/Jack Stone‡

Planning for Physical Installations Requires More Than Just Enthusiasm

This is Part 9 of a continuing series on new users learning to cope on the job.

We DPers are truly whiz kids when it comes to planning for physical installations. However, most users, particularly those in the office automation arena, do not have the experience to perform these functions easily and effectively, so when they wind up with the responsibility, complications often abound.

Ira Schoen found that he had to cope with this problem as part of his job to install twin minis in the offices of his directorate.

As a new member of the user community, he was devoid of installation planning experience, but he instinctively knew that certain tasks had to be accomplished well in advance of the hardware arrival dates (November 1981).

He set about early in August, shortly after the order was placed, to construct an installation game plan. However, as part of Ira's philosophy of building systems' competencies — and, therefore, systems independence within his own organization — he was determined to do it on his own and not ask his DP group or the machine vendor for help, even though he felt they would try to respond.

Classic Problem

Ira was faced with this classic problem: His users had valid needs — many embraced a long wish list — but he had to enlighten them about the time and energy investment required to reap DP benefits. So he set up a strategy by which he intended to educate the branch and division chiefs on this matter — without scaring them away altogether.

First, he would meet with the chiefs individually — all two dozen or so of them — to review their automation programs and assure them that the effort applied would be worthwhile. This would take place after their one-day training program, which was expected to put them in receptive frames of mind.

Second, he would give each unit a workstation, plus a local diskette drive and a daisywheel printer. By doing so, the units would be reasonably self-sufficient and not dependent on Ira's group for day-to-day support.

Third, he would encourage a spirit of cooperation among the various units so they would support each other in times of hardware failure or peak overloads.

The Needs Statement, a Phase I assessment of needs for Ira's directorate, was issued by the DP group in the spring of 1981 and formed a logical starting point for his planning efforts.

Thereafter, the process involved some major tasks — plus some surprises — for which he really didn't bargain.

The first was the embarassingly acute shortage of furniture on which to place the terminal equipment. He contacted his agency's warehouse, which was willing to cooperate but had only a small inventory.

So Ira found himself involved in negotiations with 21 operating units, wheedling ("Can't you locate the coffee pot on some other table?") threatening ("Last May you said that you wanted the workstation and now you won't even spring for a typing chair; find one, or the machine goes back to the factory") and cajoling ("I'd be glad to pull out the workstation power plugs so you can use the outlet for Christmas tree lights, but can't we use the outlet for the workstation until then?").

Another challenge occurred the day the equipment arrived. The offices were awash with 86 crates, all encoded with equipment types. That was the good news. The bad news was that the codes were indecipherable to both Ira and the movers.

"The vendor may have a penchant for solving the puzzle of Rubik's cube, but this is ridiculous!" he noted at the time. (A short while later, Ira solved the problem when he astutely observed that the crates fell into the classes of dimensionality and concluded that a workstation could be configured from one member of each class.)

Then there was the matter of vendor communications, a real eye-opener for Ira. He was taken aback that no one from the vendor company took the initiative to provide him with installation information, particularly shipment and arrival schedules. Ira always had to call for it, and it was then expeditiously supplied. And he was annoyed when, only two weeks before equipment arrival, somebody called from the vendor to make a first-time offer of installation and training assistance. Ira had been at it for months.

The corker was the question of vendor sales expertise. Ira commented: "His business must be booming. Here our directorate is about to receive equipment worth about $250,000, and we have yet to meet, much less receive, a thank you call from our sales representative."

Letters to Stone should be addressed to him at Box 270, 1377 K St., N.W., Washington, D.C. 20005.

IS YOUR INVESTMENT

The ability to respond quickly to rapidly changing market conditions can mean the difference between getting rich and getting stuck.

But in order to make quick business decisions, you need up-to-the-minute information, immediately. And you need it in a form [illegible] decision-maker, can use. That's why Sperry Univac created [illegible] 80 ESCORT.

[illegible] use the computer to get [illegible] answers to your questions. Without learning computer language. And without a programmer.

What's more, with ESCORT, you can design your own applications. Even add new information to the computer's data base. All by yourself.

And you can do all this even if you've

[illegible] is a division and registered trademark of Sperry Corporation.

Y MAXI WHEN THE 'S MINI?

never seen a computer before.

Providing, of course, that the computer you use with ESCORT is the Sperry Univac System 80. Which happens to be the ideal computer for medium-to-large companies anyway.

So if you're not getting all the information you need to make quick business decisions, decide right now to call your Sperry Univac marketing office for a free demonstration.

Or write to Department 100, P.O. Box 500, Blue Bell, PA 19424, for our product brochure.

And we'll show you how Sperry Univac System 80 ESCORT can minimize your problems. While maximizing your profits.

SPERRY UNIVAC

The computer people who listen.

The Process and Payoffs of Software Inspections

(Continued from Page 33)

the needs of the particular environment.

Each project that is implementing inspections should develop such specialized criteria, referring to items such as the specific operating system, the particular software application and the implementation language. The items listed in the baseline model can be expanded to meet a project's specific needs.

The second tool is the checklist. This outlines the various categories of problems that may be encountered. Each category contains a series of questions used to locate problems. While checklists are not intended to be an exhaustive list of problems, they are a representative sample of common types of problems.

Checklists vary for each of the inspection phases. Only code checklists are language-specific. Like the criteria for inspection materials, the checklists include general questions pertinent to any application, as well as additional questions that are specific to a project's environment.

Any one checklist may include as many as 100 items to be reviewed in categories such as the programming modules functionality, data usage, control logic, external linkages, computations, maintainability and readability.

While the design-review checklists are general in nature, the programming-language checklists are specific to languages and systems, such as Fortran, Cobol, PL/I, Mark IV, IMS and so on.

Uses for Checklists

Checklists are used in several ways. Each team member should be familiar with the questions on the checklist to assist in finding problems. During the preparation period, the checklists can be used as a way of reviewing the materials. Based on previous experience, the moderator may advise the team to pay particular attention to specific problem categories during preparation.

The last tool is the systematic recording by the moderator of the events and findings taking place during the inspection meeting. Using well-designed forms, a problem report is developed that records the errors reflecting omissions, violations of standards, wrong logic and even extra features. This data becomes the basis for the rework and subsequent reinspection if necessary.

The data also becomes input to the ever-expanding statistical data base of discovered problems and problem types. This data, over time, will provide helpful information to management in improving the organization's skills and in eliminating bad working habits. For this purpose, error rates per thousand lines of code or per thousand lines of design statements are tabulated by individual, project and module types.

The principal benefits of inspections observed both at IBM and at Informatics are as follows:

- Significant reduction in testing time by as much as 65%.
- Significant reduction in coding errors and functional omissions during the software operational phase. As many as five times the number of problems occur during operations for systems built without inspection.
- Improved quality of the finished product from the functional point of view.
- Improvement in the professional performance of individuals participating in the inspections, quantitatively seen by a reduction in error rates over time and an increase in lines of code produced per unit of time by as much as a factor of two.
- Identification of common problem areas for the entire staff, which can then be given proper management attention and correction.
- Early warning signals of potential problems with individuals and identification of "error-prone modules" when the inspection discovers error rates that significantly depart from the norm.

Inspections provide a subtle and very important contribution to software development and operation. The inspection process shifts the discovery and correction of errors and defects from software's operational period to the early design stages. Since the cost for software corrections during operations is many times the cost incurred in detecting problems during design, inspections provide an unusual leveraging of cost/benefit over the entire life cycle of the software.

Inspections are not free. Design inspections can require from two to six hours per person for 1,000 equivalent lines of code, whereas code inspections can require between five and 15 hours per person for each 1,000 lines of code.

The payoff is in higher performance in quality and delivery of the product. Experience has shown that projects starting with stated requirements and undergoing the discipline of inspections were completed close to schedule and delivered at less than $5 per line of code produced at a rate of nearly 10 lines per hour.

The additional effort applied to inspections has a positive impact on productivity — primarily due to the substantial reduction in the maintenance activity resulting from the higher quality of the product.

Frank is executive vice-president of Informatics, Inc. in Woodland Hills, Calif.

Let our experience work for you! In 1981, system designers, OEMs, and contractors ordered more than 1,000,000 feet of Ethernet cable from Times Fiber Communications for installations in single buildings and entire complexes.

GET 1,000,000 FEET OF ETHERNET CABLE EXPERIENCE WORKING FOR YOU.

Why Times? Because we're one of the oldest and largest manufacturers of coaxial cables in the U.S. And we have three plants strategically located throughout the country producing cables for all types of local networks and system interconnect.

Plenum version is UL listed

TFC's Ethernet cables are available in two versions. Standard polyethylene for in-wall or under-floor construction, and plenum for return air drop-ceiling applications. The plenum version is listed by Underwriters' Laboratories and passes the Steiner Tunnel Test. It features a high velocity fluorocarbon dielectric which prevents signal degradation or shorting due to moisture collecting in the cable.

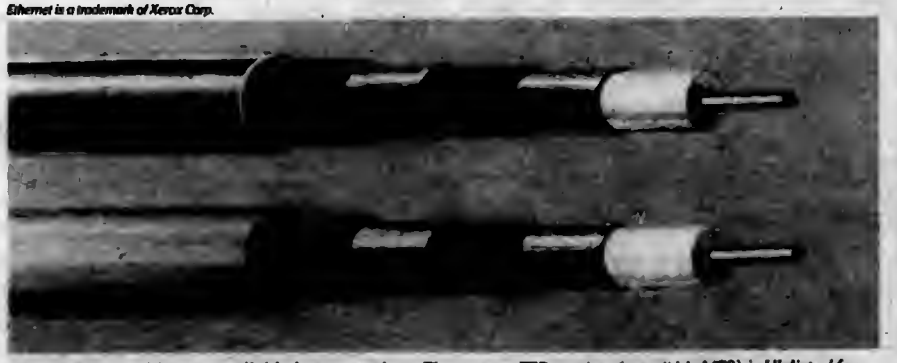
Unique shielding configuration

TFC's Ethernet cables have been engineered for easy installation and tapping. A unique shielding configuration keeps signal leakage and interference—critical in local network systems—within the Ethernet specification requirements over a broad frequency range. The outer conductor/shield of the Ethernet coaxial cable consists of two braided shields with several layers of metallized tape.

The construction has a transfer impedance of 0.11 milliohms/meter at 3 MHz. For comparison purposes a normal single shielded coaxial has a transfer impedance of 27 milliohms/meter at 3 MHz and a double shield has 0.8 milliohms/meter. Therefore you can be assured your data stream will be protected from EMI, RFI and other hostile environmental factors.

The cable has a maximum attenuation of .37 dB/100 ft. at 5 MHz and .52 dB/100 ft. at 10 MHz. With these attenuation values it is expected that signals in a half

Ethernet is a trademark of Xerox Corp.



TFC's Ethernet cables are available in two versions. The orange FEP version (part #AA-4478) is UL listed for plenum applications, and the yellow PVC-jacketed version (part #AA-4479) is for standard applications.

LETTERS

More Follow-Up

I very much enjoyed the In Depth interview by Rex Malik, "Jean-Jacques Servan-Schreiber" [CW, Feb. 8]. Making home computers available to the Third World, with all the education required of those making them available, is a massive effort, but the potential applications seem limitless.

I would be particularly interested in what the teams involved learn as they uncover these various applications. This is a little like bringing electricity or telephones to everyone, but considering the graphics as well as text capabilities already available through home computers, many people in various cultures can get used to them in their own ways. I wonder what their effects upon the various communities will be?

I hope that *Computerworld* will include reports about the findings and activities of the Group of Paris from time to time. Our own economic growth depends upon increasing involvement with the Third World, and the more we have in common, the easier that will be.

Joseph Richardson
New York, N.Y.

In Self-Defense

Most of us who are actively contributing to the world of computers are far too busy fighting alligators and draining swamps to speak up and defend ourselves against the self-serving ministrations by the free-lance corporate bandits that you so blithely grant free (?) space in *Computerworld*.

There have been many, oh so many, of these articles in the past few years advocating even more of the morale-devastating, turnover-producing manipulation of the productive workers in the computer field. So I really don't have much of an axe to grind with the author of the latest diatribe, one Gary Slaughter ["Managing the Maverick," CW, March 22].

He obviously makes his living with his sure-fire panaceas, and I can't blame him at all for getting all the free advertising he can. However, my point is simply this: "Is he one of us?"

It seems to me that *Computerworld* should have broader interests than devoting so much space to the manipulation of people. Aren't there many personnel journals for that sort of thing? It would appear that you might be alienating your most valuable professional readers.

John B. Horne
Huntington Beach, Calif.

Hurts, Not Helps

Lasting data processing success stories are the result of dedication and commitment to a single firm, not multiple job changes for increased compensation and/or position improvements.

In "Women Told DP Not Best Route to Top Positions" [CW, March 17], Pamela A. McGhee is quoted as having said: "Businesses use DPers ... because of that we have to look out for ourselves."

This advice contributes to our current unfavorable image. We are already viewed as having more loyalty to our profession than to the company that employs us.

This attitude also creates an adversary relationship between DP and business that impedes efforts to enhance the role of data processing. Our charter must be to establish credibility by becoming a more integrated, compatible department within the company we serve.

The formula for DP success is to learn the company business, establish good rapport with and gain the confidence of the user group and provide the data processing service that is expected.

This service will happen faster, with less agony and its quality will improve with each additional year the DPer has with the company.

It is the positive continued achievement and feeling of teamwork between departments that generates the ultimate personal success, not some defensive action taken because of a negative view that the company is going to take advantage of the DPer.

James R. Kelley
Cincinnati, Ohio

Offensive to DPers

"Programmers Are Overpaid, Immature" [CW, March 15] is, at least in part, offensive to a vital, hardworking and dedicated group: the DP professional.

Charlene Franci of Security Pacific National Bank should include in her study middle-of-the-night phone calls rousing these "money-motivated" people out of bed and down to the data center for no extra pay, or 12 to 14 hour days required to complete a project with no extra compensation. "Deprofessionalization" should come to an end; however, it should be replaced by extra pay for overtime.

Introduction of software tools and increased training will reduce the shortage of programmers. Also, there is a great need for more business-oriented analysts.

However, simplistic, child-like accusations do a great disservice to a vital group of people without whom American industry could not have made such quantum leaps in information science as have been made in the last two decades.

Fred Knauer
President
Knauer Computer Consulting, Inc.
San Francisco, Calif.

duplex mode with rates as high as 50 Mbps can be transmitted up to 2.5 km without amplifiers.

For all networks

TFC's Ethernet cables are also designed to work in all expandable baseband networks. Our systems engineering staff will be glad to assist you in the selection of cable for your specific network.

TFC has been setting standards and meeting new challenges in coaxial cable design and manufacture for 30 years. The company now has more than a thousand types of coaxial cables available—including its new plenum cable series.

For more information, call or write John Palasciano, Marketing Manager, Local Network Products, Times Fiber Communications, 358 Hall Avenue, P.O. Box 384, Wallingford, CT 06492, (203) 265-8439.

TFC
TIMES FIBER COMMUNICATIONS, INC.
RF CABLE PRODUCTS DIVISION
An [illegible] Company

LETTERS

DP Here to Stay

In response to "Execs: Programmers Are Overpaid, Immature" [CW, March 15], I offer the following comments:

Thomas and Charlene Francl's conclusions about programmers leave me a little disturbed. For example, the statement: "With software tools available today, the end-user department can create 50% of an application, and with the aid of microcomputers, users can develop 90% of the applications."

Great idea! We move the programmer to the user department, give him a computer of his own and the problem is solved. Wrong! It is just starting. Before you know it, everyone has his own hardware, software, applications, data bases and headaches.

The backlog of work in data processing is based upon user demand vs. data processing resources. Moving the programming to the user isn't going to change this one bit. The only difference will be that the user will be responsible for his own backlog, because he will still have one.

As for programmers having little or no loyalty, that is like saying all teenagers are bad. You have your job jumpers, but it only works so long (normally the first three to five years). After that they had better show signs of stability or be very specialized. As an employer, the track record is one of the first items I review when hiring.

I must agree that money is a great motivator and is not necessarily unique only to programmers. As far as the salary comparison of a programmer to a bank vice-president, we need to look deeper into job responsibility, technical expertise, stress and bottom-line contribution to a company. A programmer in a manufacturing environment may be exposed to every facet of business and be expected to relate to it and improve upon it.

In summary, data processing is here to stay. It may change the location of the programmer from the DP to the user department, but the problems users have now will still exist.

I feel the real answer is a closer working relationship between DP and the user, because that is what it will take if you want 100% of an application developed.

Fred Barnett
Director
Management Information Systems
Simplicity Pattern Co., Inc.
Niles, Mich.

A Slap on the Wrist

Regarding my reader commentary "Programmers Don't Need to Communicate in English" [CW, Dec. 7], a slap on the wrist to *Computerworld*. Although it is your right to alter any article you publish, programmers do need to communicate in English. By giving my article your own headline it put everyone on the defensive before they even read it. This resulted in much confusion.

The lack of communication and communication skills mentioned in the article does not refer to "English illiteracy" as some have construed it; it means "literary excellence," as a technical writer might expect. And the "translators" and "trained systems analysts" may better be understood if called "management information systems secretaries" and "documentation and training specialists."

My article was meant as a rebuttal to Charles Verbisky's reader commentary "Learn to Communicate in English and Basic" [CW, Nov. 9], whose point was that we should be spending as much time writing and rewriting our letters and memos as we do writing and updating our programs.

There are many professionals in all fields that cannot type up their own letters or presentations using proper typewriter spacing and margins and correct spelling and punctuation without the help of their secretaries.

They wouldn't be expected to. (This of course doesn't mean they can't communicate.)

Why should programmers be expected to be "literary artists" as well as "electronic translators and software designers?"

Camille Kostosky
Berwind Railway Service Co.
Hollidaysburg, Pa.

Small Asteroids

The letter to the editor from Martin A. Goetz [CW, Feb. 8] needs one small correction.

If infinitely many of the monkeys could be depended on to treat their typewriters in a suitably random fashion, they would type not just one copy but infinitely many facsimiles of the Gettysburg Address, together with the complete works of William Shakespeare, the Holy Bible, the next 52 issues of *Computerworld* and every IBM manual ever issued with all typographical errors removed.

While all this makes a fascinating and instructive intellectual exercise, the reader may be relieved to know that in the real, finite world we live in, the chance that any particular monkey will type even a few sentences of intelligible English is very much more remote than the chance that I will be flattened by a large meteor (or small asteroid) before I sign this letter.

John Burr
Computing Science Department
University of New England
New South Wales, Australia

TOP SECRET the total resource protection package for MVS, works best of all.

Security is top priority in data centers today. A critical problem that demands an uncompromising solution. TOP SECRET is the answer.

TOP SECRET is data security at its best. Easy to install. Quick to implement. Comprehensive in the resource protection it provides. TOP SECRET immediately secures your most critical resources without impacting normal processing.

TOP SECRET requires absolutely no modifications to your operating system. On-Line job submissions are made with no JCL changes. You can implement security with no delay.

By using the Standard MVS Security Interface, TOP SECRET becomes an integral part of the operating system. Complete compatability with all IBM and vendor products that use Standard Security is automatic and guaranteed. Now and in the future.

TOP SECRET gives top level security and comes with the same top-notch technical support that guarantees the quality and reliability of all CGA software products. Join the MVS-sites across the country that have found the TOP SECRET answer to total resource protection.

Call for a free trial today.

800-543-7583. In Ohio, call collect (513) 890-1200.

cga Software Products Group, Inc.
212 West National Road
Vandalia, OH 45377

DEC Dibol Runs Under VAX/VMS

MERRIMACK, N.H. — Digital Equipment Corp. has announced an implementation of Dibol, its programming language on its VAX-11 and Datasystem 700 series of 32-bit superminicomputers.

Dibol is described by the vendor as a programming language specifically developed for writing business and commercial applications programs. The new implementation, called VAX-11 Dibol, runs under the VAX/VMS operating system.

VAX-11 Dibol reportedly is compatible with the PDP-11 Dibol used on DEC Datasystems configured around PDP-11 minicomputers. This is intended to enable users to run Dibol-11 applications programs on VAX-11-based computers without having to translate the programs to another form.

The software is said to take advantage of the VAX operating system's services and common runtime library. In addition, it utilizes virtual memory support, enabling execution of large programs without overlaying or segmentation, the vendor said.

VAX-11 Dibol is licensed at $7,900 and is scheduled for shipment this month, the vendor said from its headquarters in Maynard, Mass. 01754.

'Alms' Facility Runs on IBM OS, Compatibles

FOREST HILLS, N.Y. — Roncom Systems, Inc. has introduced a source program maintenance facility called the Automated Library Maintenance System (Alms) for use on IBM and plug-compatible OS systems.

Alms includes a data base designed to maintain the relationships among the load modules, source programs and copy members managed by the system. The data base also permits the automatic recompiling and relink editing of those programs that must be regenerated

(Continued on Page 40)

Project Planner Goes On-Line

PHILADELPHIA — An on-line version of its PC/70 Project Planning and Control System for IBM and plug-compatible mainframes and Hewlett-Packard Co. HP 3000 systems was announced by Atlantic Management Systems, Inc.

The package was designed to enable users to enter, maintain and report project planning and cost data in a conversational and interactive manner. Its features reportedly include full-screen mode for data entry and reporting, prompting of users and validation of data to be entered, operator password, terminal ID and specific transaction security and data recovery.

PC/70 on-line reportedly allows the user to perform "what if" planning.

PC/70 on-line is priced between $35,000 and $40,000. Atlantic Management Systems is at 320 Walnut St., Philadelphia, Pa. 19106.

'Datareporter' Updated, Supports IBM DL/1

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced Release 2.6 of its Datareporter information retrieval and reporting package for use on IBM and plug-compatible mainframes, which is said to include support for IBM DL/1 data bases and ADR's Dataquery query package.

As a component of the ADR/Datacom System, Datareporter is said to allow users to access record collections that have been retrieved by ADR's Dataquery interactive relational query package and saved in a "found" file.

Support also has been added for IBM's DL/1 data base management system, the vendor explained, so users can format reports or extract data from DL/1 data bases. Data extracted in this manner can be loaded into Datacom/DB data bases and accessed by Dataquery or Datareporter.

According to ADR, DL/1 files are identified through the standard Datareporter File statement, with specific request information such as function code, number of segment search arguments, segment name and actual search arguments passed via a standard I/O area.

The Control statement of Datareporter in Release 2.6 also has been modified to allow sort-sequence fields and control-break fields to be sorted in either ascending or descending sequence, ADR said.

The permanent license price for Datareporter is $11,000 for the OS version; $9,500 for DOS; and $7,100 for IBM Models 4321, 4331, 370/115, 370/125 and 370/135.

ADR is located at Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

Lutz: Software Tools Must Give Control of Data To DP, Make Data Accessible to Users

By Robert Batt
CW West Coast Bureau

CANOGA PARK, Calif. — Unless software tools are available that allow the DP department to remain in control of the data while allowing users to access it, there is a great possibility that computer resources will remain untapped.

This was the warning from Merritt Lutz, vice-president of Informatics, Inc.'s Software Products Group, in an interview here. He said proliferation of computers could lead to enormous waste of technological investment unless adequate software tools are available.

The key to supporting the information needs of large corporations, according to Lutz, is to enable the DP department to do its job more effectively. He said the crisis in productivity can best be overcome through the DP department where the initial investments were made and the data created. His argument is that providing software tools to the end user may be profitable in the short run, but could be counterproductive to users over the long haul.

"Data processing managers and corporations are being threatened by the proliferation of computer intelligence. The tendency now is toward distributed processing [that is] not controlled by a centralized processor. There is a danger that corporations will not take advantage of the investments they have already made," Lutz added.

Backlog Warning

Lutz warned of the backlog of products within management information systems departments that DPers cannot meet. Users are being sold on the potential of new technology only to have their expectations dashed. "We think users are going to get the intelligence they require with or without DP," he said.

One of the ways to cut down on the backlog was to offer users tools to enable them to create their own projects, Lutz said. The need for these would increase as IBM introduced products requiring software application tools.

David Saykally, Informatics director for new business operations, forecast several IBM announcements this year in the area of data bases, personal computers, communications and the 8100 distributed processing system.

"We are addressing the productivity problems of large corporations. The more hardware IBM releases, the more serious the productivity problem becomes. Our challenge is to follow the opportunities provided by IBM announcements and to provide solutions," Saykally said.

CICS USERS

Isn't it time you found out who's using CICS?

You've put a lot of time and effort into installing CICS. You're spending thousands of dollars each year on CICS hardware and software. But you have no idea who is using CICS, when they're using it or what data is being accessed.

Now CAMS, the CICS Accounting and Monitoring System, can tell you all that, plus more. Automatically. You'll also discover bottlenecks and causes of poor response time. And you'll learn whether you need more terminals, or if you just need to rearrange your current configuration.

Find out who's using CICS by finding out more about CAMS.

4/82

Universal Software Inc.
Brookfield Office Park
Brookfield, CT 06804
TEL: (203) 792-5100

CALL TOLL FREE: 800-243-0543

☐ Send more information on CAMS.
☐ Send information on your other products.

Name/Title _____
Company _____
Street _____
City/State/ZIP _____
Phone(____) _____ CPU _____ CICS REL. ____

For IBM, Plug-Compatible Systems

'Vsexit' Intercepts Vsam Errors in Cobol

NEW YORK — A software package said to handle Vsam errors in Cobol programs running on IBM and plug-compatible systems under DOS/VS(E) has been announced by the Davidson Group.

Vsexit reportedly intercepts run-time Vsam errors, the vendor said. Vsexit is incorporated in e user program at linkage edit time by means of an INCLUDE statement with the program source remaining unchanged. The included module occupies 3K bytes and is selectable for test or production mode use, the vendor said.

Vsexit is said to inform an operator automatically what the error detected is, accept the operator's reply command to reopen the unavailable files or cancel the request after closing all open Vsam files in the program.

There is a one-time license fee of $1,950 with multisite installation discounts evailable. The fee includes one year of maintenance support, and e two-year lease/purchase et $100/mo can be arranged.

The Davidson Group is located at 90 Broad St., New York, N.Y. 10004.

Credit Package Fits System/34

MILL VALLEY, Calif. — A software package for credit and collection agencies operating the IBM System/34 has been unveiled by Millerick & Associates, Inc.

The Collection Agency Debtor Accounting System reportedly features menus and on-line data entry, controls and edits, eudit trails and same-day new business processing.

It elso features automatic interest updates, on-line inquiry, debtor status reporting to clients and match-up capability to tie multiple accounts together, e spokesman said.

The package, including RPG-II source code and systems documentation, costs $10,000 from the vendor at Suite 243, 655 Redwood Highwey, Mill Valley, Calif. 94941.

Do you know where DBMSs will be in 1985?

...would you like to go to a *Free Seminar* and find out?

CCA, the leader in software for information storage and communication, invites you to a free seminar on "DBMS in the '80s." The seminar will discuss:

- The major challenges confronting data processing executives in the 1980s.
- How CCA's Model 204 DBMS—the most advanced DBMS available for IBM systems—is being used by America's leading corporations to meet these challenges.
- How CCA's Distributed Model 204 DBMS, the world's first general-purpose distributed DBMS, will tie together databases residing on different machines and make the location of data transparent to the user.
- How CCA's VIEW System uses graphic interfaces to provide the user with "keyboard-free" interaction for complex databases.
- How CCA integrates DBMS and office automation technology.

Free Seminars will be offered on the following schedule.

To reserve your space at the free seminar, call Theresa Pinheiro at 617-492-8860.

April	May	June
13 Cincinnati, OH	4 Richmond, VA	3 Wilmington, DE
13 Honolulu, HI	5 Washington, DC	3 Princeton, NJ
14 Atlanta, GA	11 SanFrancisco, CA	8 Santa Clara, CA
20 Wichita, KS	12 New York, NY	9 Dayton, OH
21 Winston-Salem, NC	19 Indianapolis, IN	10 Columbia, SC
21 Tulsa, OK	19 Philadelphia, PA	15 Springfield, MA
22 Albuquerque, NM	20 Boston, MA	22 Portsmouth, NH
27 Des Moines, IA	25 New Orleans, LA	29 Dallas, TX
	26 Oklahoma City, OK	
	27 Little Rock, AR	

Computer Corporation of America

Cambridge, New York, Houston, San Francisco, Chicago, Washington, Los Angeles
International Affiliates: Tokyo, London, Berng, Milan, Toronto, Melbourne, Paris

DOS Users Gain Version Of 'Adders'

BOSTON — A version of Rendeck Corp.'s Adders data entry and systems development system for IBM'a DOS users, which includes an audit trail facility and enhanced security features, is now available.

The audit-trail operator statistic reports on the activity of operators giving statistics such as start and finish time, number of keystrokes made, number of fields keyed and number of errors showing up on verification, the vendor said.

The audit trail reportedly logs events such as extension, deletion or duplication of batches and verification restarts, making it possible to track any discrepancies and isolate where they occurred.

A second capability provides optional recovery methods for data entry files with fast or slow recovery options available. By using an overriding password, supervisors can gain reports on other operators' passwords, change information already input and generate documentation on various screens used for input, the vendor explained. Changes are noted on the eudit trail.

A facility to stop verification at mid-batch, end then start at the same point at a later time, has been included along with e batch control lock to prevent check totals from being prepared until after verification takes place, the vendor said.

Adders costs $14,000 and is available for e free trial or demonstration from Rendeck, 5 Faneuil Hall Marketplace, Boston, Mass. 02109.

'Alms' Directed At IBM OS Users

(Continued from Page 39)

when new versions of source and/or copy members are introduced, the vendor explained.

The package reportedly provides the user with a facility to store source programs and copy members on one or more libraries while optionally maintaining a backup of prior versions. These libraries may be OS-partitioned data sets or Applied Data Research, Inc. Librarian or Pansophic Systems, Inc. Panvalet libraries.

When the user replaces source programs and copy members, the Alms automatically marks on the data base those objects and load modules that will require regeneration, the vendor said. After the user is finished with a set of changes, the Alms package can be requested to perform the necessary regenerations, the vendor said.

A permanent license fee for Alms is available for $9,200 from Roncom Systems et 110-33 72nd Ave., Forest Hills, N.Y. 11375.

'Cobmap' Optimizer Lists Cobol Compiles for IBM

BAY VIEW, Wis. — A Cobol compile listing optimizer designed for users of IBM and plug-compatible OS systems was announced here by Charles A. Warren & Associates.

Cobmap reportedly postprocesses the Cobol compile listing to produce an optimized listing. It does this via a process that matches and appends the information contained in the data and procedure maps to the corresponding data and procedure division source statements. The original map data is purged from the Cobmap output listing, the vendor said.

Other features of Cobmap include enhanced data record design and development, documentation for data records and an assembly language training aid.

Version 1.1 of Cobmap is priced in the $4,000 range for object code. The software will be available May 1, from Charles A. Warren & Associates, 2864 S. Linebarger, Bay View, Wis. 53207.

'Screen' Enters, Edits Data For Basis DBMS

COLUMBUS, Ohio — A screen-oriented data entry and editing feature has been added to Battelle, Inc.'s Basis data base management system (DBMS) for users of IBM, Digital Equipment Corp., Sperry Univac and Control Data Corp. systems.

The feature — called Screen — enables users to enter and edit data into the Basis system using formatted terminal screens. Screen can be used with DEC VT100, VT52 and Hewlett-Packard Co. 2600 terminals, according to the vendor.

Screen enables Basis users to access and validate data base records and to define formatted screens. It also allows users to highlight information displayed. Since the user's screen is defined in the Basis data definition language, no programming effort is needed for Screen.

Basis, with the Screen feature, reportedly runs on DEC Decsystem-10 and -20; IBM 370, 30 series and 4300; CDC Cyber and 6000 series; and Univac's 1100 series mainframes as well as DEC's VAX 11/750 and 11/780 minicomputers. Screen costs $15,000 for mainframes, $10,500 for minicomputers.

Battelle's Columbus Division is located at 505 King Ave., Columbus, Ohio 43201.

'Import' System Out for Investors

NEW YORK — Monchik-Weber Corp. has introduced the International Multicurrency Portfolio System (Import), designed to meet the needs of investment professionals. Import runs on the IBM System/34.

The accounting system is said to provide recordkeeping, pricing files and valuation reports, listed in separate as well as base currencies.

Automatic reports are produced on a daily, monthly and client fiscal year-end basis. Reference files include data on clients, securities and custodians and are updated daily.

Import is available for between $95,000 and $125,000, depending on features selected, from the vendor at 111 John St., New York, N.Y. 10038.

"Direct from the Authors"

BATCH REPORT RETRIEVAL

CPMS®-CICS Print Management System

- Route reports to any CICS printer
  - Reduces need for RJE and couriers
- Display batch reports on CICS 3270s
  - Reduces printing costs
- VSI, MVS, CICS/VS, JES I, JES II
  - No modifications to SCPs or appls.

Site license under $5,000

H & W Computer Systems, Inc.
P.O. Box 4173
Boise, Idaho 83704 • (208) 377-0336

"We have found the MCBA HP Accounting Packages to be unequalled in the industry on a price/performance basis."

"In addition to the superb efficiency and effectiveness of MCBA software and the ease with which it can be installed, MMI feels that the technical and user documentation provided with each software package is outstanding—in fact, so outstanding that it should be used as an industry standard.

"From an operating standpoint, MCBA software is very "user friendly." Non-technical people can pick up the operating aspects of the software with minimal training.

"If you are tired of looking for high-quality, reasonably priced accounting software for the HP 3000 and finding only overpriced, inefficient, machine-overhead-gobbling packages converted to HP from mainframes like IBM, don't give up hope! Call MCBA. We did."

Richard W. Merz
Vice President
Man Machine Interface, Inc.
Westlake, Ohio

MCBA Software Moves a lot of HARDWARE

MCBA has high-quality, interactive accounting packages written specifically for the HP 3000 in COBOL using IMAGE... and they don't cost an arm and a leg!

Join the more than 9000 users and 800 OEMs who have discovered the value of using MCBA software, on Hewlett-Packard, Digital Equipment Corporation, Wang, Texas Instruments, and Data General minicomputers.

MCBA®
Mini-Computer Business Applications, Inc.
2441 Honolulu Avenue
Montrose, CA 91020
Telephone: (213) 957-2900
Telex: 194188

Please send me full information on MCBA's Hewlett-Packard 3000 packages:

☐ Payroll ☐ General Ledger
☐ Accounts Receivable ☐ Order Entry/Billing
☐ Accounts Payable ☐ Sales Analysis

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone (____) _____
We are: ☐ End User ☐ OEM Other _____

CW 41282

Programs in Pascal, Fortran, Assembler

Software Development Tool Set Unveiled

MANHATTAN BEACH, Calif. — First Systems Corp. has developed Microset, which is described as a cross-development software engineering tool set.

The Microset package is said to consist of program generators written in Pascal, Fortran and assembler, which run on Digital Equipment Corp. VAX systems and IBM and plug-compatible mainframes to produce programs for the Intel Corp. 8086 or 8088-based microprocessor.

Three products for the Pascal Software Engineering Tool Set (Pascalset) were also announced. Pascalset is said to be compatible with any Pascal-based processor.

In the Microset package, the FS Pascal Compiler reportedly generates machine instructions in the standard relocatable object module format used by Intel. The FS Fortran Compiler implements the Ansi standard Fortran-77 subset with extensions. The vendor said it generates output that is compatible with the Pascal compiler.

The FS assembler for the Intel 8086 supports Intel instruction mnemonics and operand formats, as well as traditional macros and conditional assembly, according to First Systems Corp.

Cost for Microset license fees depends on the hot system. Object license fees range from $500 for a host-target communications program to $10,000 for a compiler.

In the Pascalset package, PTrace provides a report about the behavior of the Pascal program as it runs through its routines, the vendor said. PMacro provides macro-definition capability for abbreviation and standardization of programming sequences. PAdapt accepts a variety of Ada-style extensions to Pascal and translates them into standard Pascal.

Base price for PTrace is $2,000. A runtime support package is required with PTrace and is available for $500. PMacro is $1,500 and PAdapt is $2,000.

First Systems Corp. is located at 865 Manhattan Beach Blvd., Manhattan Beach, Calif. 90266.

SOURCE CODE for 3270 BISYNC COMMUNICATIONS

Trying to interface your microsystem with a host computer and are frustrated because you just don't have enough time to develop your software and you want to quickly start utilizing the power of the host?

Data Retrieval Corporation of America will share with you the benefits of a major research and development communications project.

The 3270 communications source code package includes:

Source Code (written in 8080 Assembler) for an Intel iSBC 544 Intelligent Communication Controller.

- Port 1 communicates with a host computer, emulating an IBM 327X control unit.
- Port 2 communicates with an IBM 327X control unit, emulating a host computer.
- Port 3 is not used.
- Port 4 communicates with an IBM 3101 terminal, emulating an IBM 3278 terminal.

Source code (written in PLM/86, running under the iRMX 86 operating system) for a job that communicates with the iSBC 544.

Ideal for a system like the new Intel 86/330, also a saver for anyone planning on developing their own 3270 bysinc communication.

Source Code supplied on 8" single density diskettes or printout $500

DATA RETRIEVAL CORPORATION OF AMERICA
8800 W. Brown Deer Rd. • Milwaukee, WI 53223
414-355-8800

Version 3.0 of 'Easyentry' Out for PDP-11, VAX-11

CHAPEL HILL, N.C. — Version 3.0 of the Easyentry forms management and data entry system for Digital Equipment Corp. PDP-11 and VAX computers has been announced here.

Developed by Applied Information Systems, Inc., Easyentry offers on-screen design and implementation of data entry applications. It includes an enhanced record-retrieval facility, within-field editing capabilities and several validity checks to increase accuracy.

Other new features include user-specified error messages; the ability to call Easyentry forms from other programs; additional arithmetic functions such as square root, comparison between two fields, simplified table look-up and external table look-up; and native-mode user exits under VAX/VMS, the vendor said.

The menu-driven Easyentry can be used for a number of applications including high-volume data entry, transaction processing, data retrieval and prototyping. A single-machine perpetual license and one year of maintenance support costs $4,400 from Applied Information Systems, Suite 207, 500 Eastowne Drive, Chapel Hill, N.C. 27514.

'Select' Runs On PDP-11s

LEXINGTON, Mass. — Version 11 of Select, a record extraction software package for Digital Equipment Corp. PDP-11 computer systems running under the RSTS/E operating system, has been released by Evans Griffiths and Hart, Inc. (EGH).

This package can also be used under VMS on the VAX-11 with Ross/V, EGH's RSTS/E simulation package, the vendor said.

Select is described by the vendor as a machine-language package that employs user-specified selection criteria to extract from one or more input files those records needed for a specific report or application.

The user's criteria may also be used to determine which fields of a selected record are to be included in the corresponding output record.

A single-CPU license for Select is $1,500, discounted to $500 when purchased with Fsort 3. EGH is based at 55 Waltham St., Lexington, Mass. 02173.

File System For Unix Fits VAX, 16-Bit Sites

SUNNYVALE, Calif. — An indexed file system for Bell Laboratories, Inc. Unix operating systems is now available from Relational Database Systems, Inc. (RDS) for users of Digital Equipment Corp. VAX systems and 16-bit microprocessors.

Designated C-Isam, this product is said to be a library of C function calls to create and manipulate indexed files of records. Record-level concurrency control is provided by the system, either automatically or manually, at the option of the programmer.

The package is written entirely in C and can be accessed from any language that utilizes C functions. It is reportedly also the retrieval method of RDS' Informix (formerly called Marathon) Relational Data Management System, so Informix users can manipulate C-Isam files using the query language, report writer and transaction processing programs of Informix.

C-Isam reportedly features an unlimited number of indexes that can have one to eight parts, duplicate values; a derivative of the B-Plus architecture, optional leading and trailing duplicate character suppression, 4-byte record indentifier and an audit trail facility.

The product sells for $900 for use on a 16-bit microprocessor and up to $1,800 for use on the DEC VAX machines, the vendor said from Suite 503, 1208 Apollo Way, Sunnyvale, Calif. 94086.

NCA, Ross Introduce 'Maps' Interface

SUNNYVALE, Calif. — NCA Corp. and Ross Systems, Inc. have introduced an interface that makes Ross Systems' Maps package available to users of NCA's Management System and Financial System (MS-11/FS-11) users on Digital Equipment Corp.'s PDP-11 and VAX systems.

NCA's MS-11/FS-11 is an integrated manufacturing/financial, management information software package for assembly oriented manufacturing industries.

The vendor said that the new interface adds financial modeling power to the NCA system, the vendors said.

The license fee for the NCA/Maps interface is $1,000 from NCA, 388 Oakmead Pkwy., Sunnyvale, Calif. 94086.

If you are selling or considering.....

MEDICAL/DENTAL COMPUTERS

(A $400,000,000 market)

This seminar is for you!

Designed for companies in this growing, competitive market.

Your success, your survival in this market depends upon knowing your competitors, who's making it, or failing, and why; and understanding the market, the doctors, who they are, and when, where, and why they buy their systems.

We give you tools for success, awareness for survival, knowledge to make it and make it big....and much, much more. Interested?

Write or call THE EDUCATIONAL COOPERATIVE
245 South 17th Street
Philadelphia, PA 19103

(215) 545-5555
ask for Alan C. Swan

Small group seminars will be held in:
Philadelphia (sold out) San Francisco - April 28, 29, 30 Atlanta - May 5, 6, 7
San Antonio - May 10, 11, 12 Chicago - May 20, 21, 22 Philadelphia - June 9, 10, 11.

Looking for someone? Join THE MATCH GAME

Meet others with systems who are looking for outlets, or reps who want to sell you system in their market. Attend The MATCH GAME to be given with the seminar in each city. Call (215) 545-5555 for details.

CGA Utility Package Updates Run In Multiple Systems Environments

VANDALIA, Ohio — CGA Software Products Group, Inc. has announced new versions of three utility packages designed for multiple systems environments on IBM and plug-compatible mainframes running under OS/MVS, MVS-SE, SVS, MVT, VS1 and MFT.

The Super-MS1 (Multiple Systems Integrity Facility), Multiple Systems Manager (MSM) and Global Console Director (GCD) can be purchased together as the Transparent Single System Image. The new versions include an interface to the IBM SP-3 operating system.

The software reportedly allows installations with both SP-3 and non-SP-3 systems to maintain their compatibility as a single-system image. No system or software modification is necessary, a spokesman said.

MSM and GCD cost $450/mo per site. MSI can be leased for $625/mo per site or purchased for $10,000 for the first CPU and $5,000 for each additional CPU up to a maximum price of $25,000.

CGA Software Products Group is located at 212 W. National Road, Vandalia, Ohio 45377.

Sales Tool Goes Real-Time

ATLANTA — American Software, Inc. has announced an on-line, real-time feature for its Sales Forecasting System for IBM 370 software-compatible systems. The enhancements allow "what if" simulations and enhanced effectiveness, the vendor said.

Management forecast overrides can be input either centrally or from different locations. Simulations are processed with current information. Batch systems often use information that is updated periodically, the vendor reported.

The Sales Forecasting System runs on IBM 360, 370, 4300 and 30 series processors. It costs between $20,000 and $90,000, depending on options, from the vendor at 443 E. Paces Ferry Road, Atlanta, Ga. 30305.

Data Base Utility Gets Update For System/38

RESEDA, Calif. — An enhanced version of Hawkeye Information Systems, Inc.'s Data Base/38 (DB/38) utility package, designed to run under IBM's System/3 and System/34, is now available.

The latest version of the DB/38 has more thorough edits to prevent distortion of program logic when standardizing field names in RPG-II programs, according to the vendor.

The DB/38 can be implemented by users planning to convert to a System/38 and who want to run full data bases with externally described fields or standardize their programs to increase programmer productivity, the vendor added.

The DB/38 costs $1,200 and is available from Hawkeye Information Systems, P.O. Box 1194, Reseda, Calif. 91335.

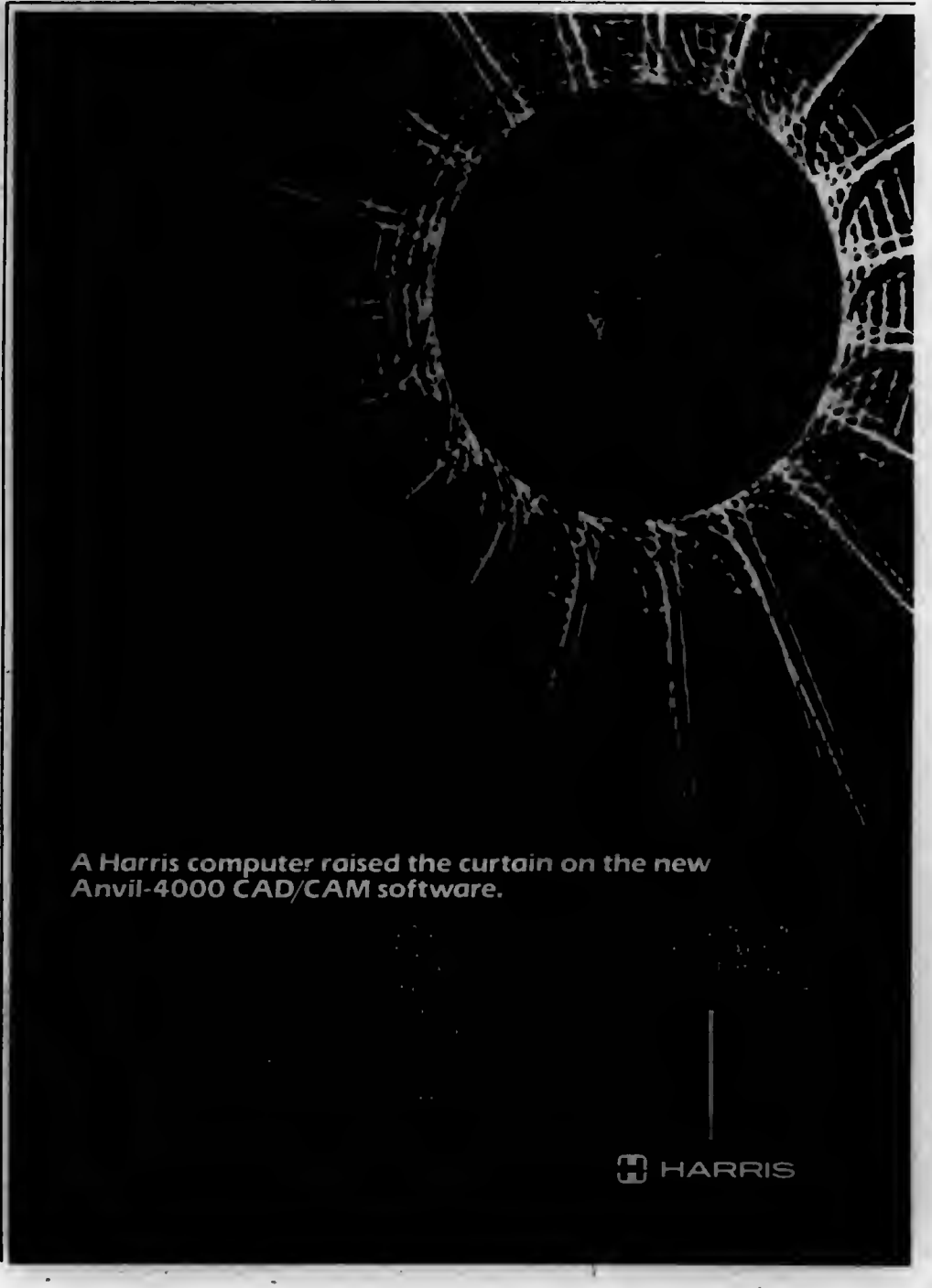
Typesetting Tool Runs on Wang VS

RIVERDALE, Md. — Informatics, Inc. has announced Composition System V, a full-page typesetting package for Wang Laboratories, Inc.'s VS family of minicomputers.

The package operates as an application program on the Wang VS using other Wang software concurrently. Packages such as word processing and other office automation packages can be used.

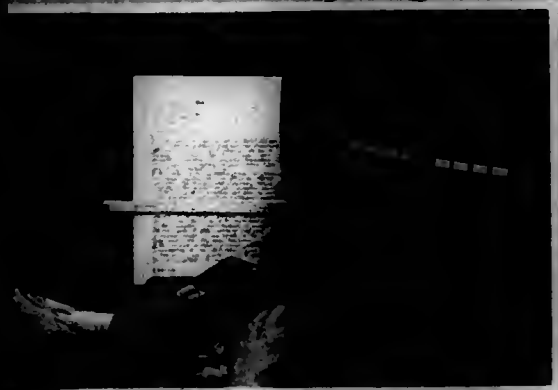
The package costs $41,500 from 6811 Kenilworth Ave., Riverdale, Md. 20737.

ELECTRONIC MAIL
FOR IMS DB/DC
Also other data base packages:
• Tables Handling
• Directory Assistance
Call or Write:
Chet R. Switala
D.B. SYSTEMS, INC
2 SOUTH PATTON AVE
ARLINGTON HEIGHTS, IL 60005
TEL. (312) 870-8605



More pow

Introducing our new top-of-the-line HP 3000 Series 64 Distributed Mainframe: more power, more performance, for more people throughout your company than we've ever offered before.

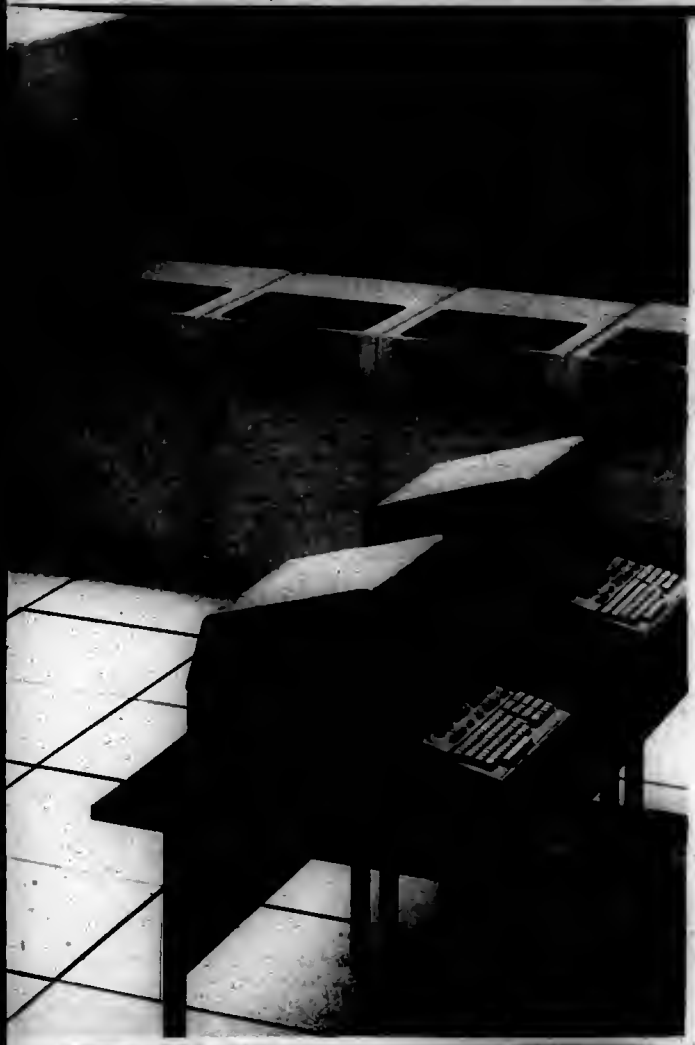


Our new word processor makes text composition and editing fast and simple. And with its links to the computer, it can also process data.

Applications development time can be slashed from years to months – with our new RAPID/3000 programming tools.

Business graphics created on this low-cost terminal can be plotted on paper or transparencies.

er to you.



The new HP 3000 Series 64 more than doubles the processing power of our popular Series 44. Now, users at more than a hundred terminals around your company can enter and retrieve data, prepare reports, do word processing or generate graphics — while the Series 64 runs batch jobs at the same time.

With up to 8 Mb of main memory and supporting as much as 6.4 Gb on disc, the Series 64 can handle your most demanding EDP applications — in sales and marketing, financial management and manufacturing administration. It also supports our HP Interactive Office by integrating document management, personal computing, support for decision making and communications. And, the system is available with our Guaranteed 99% Uptime Service.

Family Plan.

As a member of our HP 3000 family of computer systems, the Series 64 protects your data processing investment with our traditional hardware and software compatibility. This lets you transport programs between the Series 64 and smaller HP 3000s throughout your company — without lengthy and costly conversions.

But that's not all. With our new RAPID/3000 programming tools, you can develop business applications in much less time. By automating many routine computer instructions, RAPID/3000 lets you concentrate on the really important jobs.

The entire HP 3000 family now supports the international CCITT X.21 and X.25 standards as well as SNA networking. So you have greater flexibility in accessing other HP computers and IBM mainframes, across town or around the world.

And to complement the Series 64 and the rest of the 3000 family, there's our new 404 Mb HP 7935 disc drive. This new HP drive automatically monitors its own performance with self-diagnostics, making preventative maintenance a thing of the past.

Read all about it.

For more information, send for our new brochure on the HP 3000 Family. Write Hewlett-Packard, Attn: Bob Bond, Dept. 03124, 11000 Wolfe Rd., Cupertino, CA 94015. Or if you'd like to see our systems in action, call 800-227-9750 (in California, 415-857-7257) for the date and location of the Productivity '82 Seminar coming to your area.

Personal office computing with the new HP 125 handles a manager's individual needs — including word processing, graphics and data analysis. *And* communications with HP 3000s and mainframes.

HEWLETT PACKARD

47204

ASM2 versus the mountain

When it comes to controlling DASD storage, have you ever felt it was you against the mountain? Obstacles may create interesting challenges in mountain climbing, but who needs them when it comes to doing your job?

Automated: Archival • Backup/Recovery • Migration • DASD Billing • Reporting • Volume defragmentation • Volume cleanup • Standards enforcement ... and more

ASM2 was the *first* automated space management system and remains the leader because of excellent support and on-going enhancements. If you want to *do* something about your DASD problems instead of *reading* about them you need ASM2.

ASM2's powerful preprocessor, RSVP, eliminates unnecessary reports by allowing you to select only those datasets that meet your own specified characteristics. It isolates exceptions, and lets you act on them.

ASM2's recent enhancements include support for the latest IBM hardware (3380s) and software (MVS/SP and DF/DS). No other DASD management system offers such comprehensive support, including interfaces with ACF2 (also marketed by The Cambridge Systems Group), SPF, and RACF.

Let ASM2 make molehills out of mountains when it comes to managing your installation's DASD resources.

The Cambridge Systems Group

24275 Elise, Los Altos Hills, California 94022 (415) 941-4558 — Telex 357437

Representative: CSG Limited, 7 Cavendish Square, London W1M 9HA, England (01) 580-1222 — Telex 299512

Personnel, Payroll Systems Run Under Image DBMS

CONSHOHOCKEN, Pa. — Personnel Data Systems, Inc. has announced that its payroll, personnel and combined payroll/personnel systems now operate under Hewlett-Packard Co.'s Image data base management system (DBMS).

This capability reportedly permits on-line interactive data entry, inquire and update of complete payroll/personnel systems on the HP 3000 family of computers.

The universal payroll/personnel system is designed to run on any major vendor's hardware with any teleprocessing monitor and any file access method, according to the vendor. All but I/O routines are written in Ansi Cobol.

The combined payroll/personnel system costs $75,000, the personnel system alone costs $49,000 and the payroll system costs $39,000, a spokesman said from 15 E. Ridge Pike, Conshohocken, Pa. 19428.

Graphics Tools Updated for HP

BOULDER, Colo. — Precision Visuals, Inc. is offering enhanced versions of its DI-3000 and Grafmaker packages for use on the Hewlett-Packard Co. HP 3000 computers.

DI-3000 is an integrated system of 160 user-callable graphics subroutines. It offers a full range of interactive graphica capabilities, including color, three-dimensionality and a graphics data structure, the vendor said.

Grafmaker operates in conjunction with DI-3000 as a package of user-callable subroutines for high-level data presentation, including line graphs, bar graphs and pie charts.

A perpetual license for DI-3000 starts at $8,000 and at $4,000 for Grafmaker.

Precision Visuals is located at 250 Arapahoe, Boulder, Colo. 80302.

HP Brings Out Circuit Package

PALO ALTO, Calif. — Hewlett-Packard Co. has introduced a circuit simulator software package for the computer-based analysis and verification of electronic cicuits.

HPSpice runs on the HP 1000 F series computer systems using the RTE-6/VM operating system with a minimum of 768K bytes of memory. It also requires HP's Edit/1000 text editor software and Graphics/1000-II software.

The package reportedly allows design engineers to describe an electrical circuit, simulate its behavior and produce the results graphically on a number of HP graphics peripherals. It can operate in either batch or interactive modes.

It is available for $15,000. More information is available from the Inquiries Manager, Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Mercator Line Gets Phase One's Oasis

SUNNYVALE, Calif. — Mercator Business Systems, Inc. has announced the availability of Phase One Systems, Inc.'s Oasis 16 operating system for Mercator's line of business computers.

Beginning June 1, the implementation reportedly will allow users to connect from one to 16 users, choose from a range of Winchester disk capacities from 10M bytes to 160M bytes and have random-access memory capability up to 1M byte.

Oasis 16 costs $1,495 from the firm at 1294 Lawrence Station Road, Sunnyvale, Calif. 94086.

Fortran B-Tree Subroutines Unveiled for HP 3000s

READING, Pa. — A collection of Fortran subroutines designed for building and using B-trees was announced here by Computer Tamers, Inc.

The software reportedly runs on Hewlett-Packard Co. 3000 systems and Prime Computer, Inc. equipment. The vendor said it also runs on IBM equipment supporting Fortran 77 and Digital Equipment Corp. VAX and Data General Corp. computers, with some modifications.

The basic operations supported after a B-tree is built are key insertion, key deletion, random key retrieval and sequential key retrieval — either forward or backward, the vendor said. The keys can include any combination of 2-byte and 4-byte integers, character strings and double-precision variables.

The collating sequence for each variable in a key can be either ascending or descending, the vendor explained, and one to 16 pointers can be associated with each key for referencing records in different direct-access files, as well as for other uses. A B-tree can be designated to allow duplicate keys or to permit unique keys only.

The single-sale price of the source code for the B-tree subroutines, including utility routines for listing and testing B-trees, is $875, the vendor said from 1222 Dauphin Ave., Wyomissing, Pa. 19610.

You don't need more hardware...

You need a Software HERO™

HERO out-powers the competition. Meet the new software, HERO. It's got more power, more muscle and more efficiency than TSO, ROSCOE,® or WYLBUR.® It puts more programmers on line, delivers lightning-fast execution and practically installs itself. HERO increases productivity without increasing hardware costs. It's an interactive development system that runs on the IBM-compatible family of computers with more efficiency than anything you can buy. With HERO you can afford to have as many terminals as you have programmers.
You don't need more hardware, you need our software, HERO!

HERO puts software muscle at your fingertips.
- Today's best full screen editor
- Powerful JES2 interface
- Compiled command processor
- Document preparation
- Data systems security
- Support for 3270 or ASCII terminals
- ACF2® interface
- Automatic recovery system

Call now. We'll answer your questions on the spot.
Before you invest in more hardware or another development system, do this: Call us, The Software Authority. We'll answer all your questions on the spot.

THE SOFTWARE AUTHORITY
1270 Oakmead Parkway, Sunnyvale, CA 94086
YES: I want to know more about HERO
☐ Call me the moment you receive this coupon
☐ Send me more information.
Name
Title
Company
Address
City/State/Zip
Telephone
Computer/Operating System

THE SOFTWARE AUTHORITY
1270 Oakmead Parkway, Sunnyvale, CA 94086 (408) 749-9100
For overseas sales information contact:
Memorex Europe Hounslow House
730 London Road
Hounslow, Middlesex
Tel. (01) 572 7391 Tlx 938795

ROSCOE is a registered trademark of Applied Data Research, Inc.
WYLBUR is a registered trademark of Stanford University
ACF2 is a registered trademark of SKK, Inc.

Micronotes

Data Access Corp. has released Version 4.0 of its Databank software package for users of any processor using Digital Research, Inc.'s CP/M operating system. The release reportedly adds the ability to sort and select records on up to 10 fields and to output sorted, formatted data files to the system disk. Output files can be used for word processing merges, integration into other data bases or transfer over communications lines. Version 4.0 is priced at $350. A version for Apple Computer, Inc. machines, which requires the CP/M softcard and a 16K-byte random-access memory card, is priced at $249. The vendor is based at 4221 Ponce de Leon Blvd., Coral Gables, Fla. 33146.

A multiuser operating system, which allows simultaneous running of both 8-bit and 16-bit application programs while reportedly providing up to 30% more available program area, was introduced by Compupro Systems. MP/M 8-16 utilizes Compupro's 8085/8088 CPU card and features 62K bytes of user program space for 8-bit software running on Digital Research, Inc. CP/M 2.2-based systems. The operating system runs on Intel Corp.'s 8085 and 8088 microprocessors and costs $995, the vendor reported from Oakland Airport, Calif. 94614.

dBase II, a relational data base management system developed by Ashton Tate, is available from NEC Information Systems, Inc. It reportedly does not require users to use complex linking and pointers in order to relate data. It allows up to 64K bytes of record/data base file, with up to 1,000 char./record, divided into as many as 32 fields. It runs on the Digital Research, Inc. CP/M operating system on the NEC Information Systems, Inc. PC-8000 personal computer and retails for $695. NEC is located at 5 Militia Drive, Lexington, Mass. 02173.

Instant Software, Inc. of Peterborough, N.H., has introduced Easy Calc, a software product for the Radio Shack TRS-80 Models I and II. It is an electronic work sheet that reportedly allows the user to enter and save a series of calculations that can be accessed later. It costs $49.95 from the vendor in Peterborough, N.H. 03458.

Instant Software, Inc. has also released the Disk-Tape Exchanger, a utility package for the TRS-80 Model I. It reportedly allows the transfer of machine language programs from disk to tape or from tape to disk. It costs $24.95 from Instant Software, Peterborough, N.H. 03458.

Condor 20-1, a file management, inquiry and report-writing data base system from Condor Computer Corp., is available for the Hewlett-Packard Co. HP 125 Business Assistant and the Apple Computer, Inc. Apple II. Condor 20-2, a relational data base management development and operations system, also runs on both the HP 125 and the Apple II. Both systems are said to contain a help screen to aid the operator. Condor 20-1 costs $295 and Condor 20-2 costs $595 from the vendor, 2051 S. State St., Ann Arbor, Mich. 48104.

North America Management Information Control Assistance, Inc. has introduced a full-scale critical path project management system for any microcomputer using Digital Research, Inc.'s CP/M or MP/M operating systems and Compiler Systems, Inc.'s CBasic2. The PMS-II reportedly allows "what if" analysis for distributed data processing. It costs $1,295 from the vendor at Suite 260, 11772 Sorrento Valley Road, San Diego, Calif. 92121.

Pearl, an application generator, is a software package for microcomputers using Digital Research, Inc.'s CP/M operating system. From Relational Systems International Corp., the software is intended to allow users with no technical training to describe their requirements visually and in English to the computer, the vendor said. It is available for $292 from the vendor at 5002 Commercial St., S.E., Salem, Ore. 97306.

Three documentation packages have been released by Data Access Management Service for Basic programs on Miacom Office Systems, Inc. machines. Define, priced at $45, provides a data dictionary; Compar, also costing $45, furnishes a record of modifications; and Flocht, which costs $90, is said to provide flowcharts and a structured program paragraph map. The vendor is located at 3320 Rivers Ave., Charleston, S.C. 29405.

Hewlett-Packard Co. has developed file management software for its HP 83 personal computers. File Manager reportedly lets users create their own forms for entering data into the filing system. The software costs $200 from the firm at 3000 Hanover St., Palo Alto, Calif. 94304.

Computer Applications Unlimited, a division of CAU, Inc., has announced M-Zal, a modular Zilog, Inc. Z80-based assembler language for Radio Shack's TRS-80 personal computers. The disk-based development system includes full-screen option menus, a full-screen text editor, a multipass macro assembler and an object module linker, the vendor said. The package is available for TRS-80 Models I and III processors and costs $149. The vendor can be reached through P.O. Box 214, Rye, N.Y. 10580.

A data base called Super, designed for micro-based data management systems to run under Digital Research, Inc.'s CP/M and on all Radio Shack TRS-80s, is available from the Institute for Scientific Analysis, Inc., P.O. Box 7186, Wilmington, Del. 19803. Manual price is $25; TRS-80 versions are $250 and CP/M versions are $300.

A Basic interpreter compiler said to be compatible with Digital Research, Inc.'s CP/M is available from Holland Automation U.S.A., Inc. The Basic compiler is available in two models: The base model is $350 and the second model, which allows programmers to compile their own programs in Basic, is $450. The products are available from Holland Automation International, Inc., 345-N4 University Drive, Costa Mesa, Calif. 92627.

A program called Rebackup, said to create unlimited backup copies of protected software, running on Radio Shack's TRS-80 Model III microcomputer, is available now for $24.95 postpaid from Data Associates, Box 882, Framingham, Mass. 01701.

COMPUTER OPERATIONS

PLANNING EDP EXPANSION? New Site? Modernization of Existing Facilities?

D.P. Facilities Engineers and Designers have 20 plus years of experience to move your facility into the next generation.

- Advance Techniques in Architectural, Engineering and Interior Design.
- Construction Methods & Materials
- Environmental Air-Conditioning
- Uninterruptible Power & Voltage Stabilization
- Fire Detection & Suppression
- Total Security

TIME A FACTOR? Call our D/C expedite group today – for a guaranteed completion date.

(212) 674-8600

D.P. FACILITIES INC., NATIONAL

250 Park Ave. South, N.Y. 10003

ENCRYPTION

CRYPTIC

Bring it all together

With our new TC-5 Terminal Concentrator

The advanced, easy to use statistical multiplexer for up to 16 asynchronous terminals, over a single telephone line

- STATISTICAL MULTIPLEXING — Efficiencies to 400 %
- COMPLETELY TRANSPARENT — No hardware or software changes
- ENHANCED STANDARD FEATURES — Fully supports dial-up modems, Break, Autobaud, ECHOPLEX, and auto-restart
- EXCEPTIONAL FLEXIBILITY — Configure each port separately to ANY popular baud rate, character format, flow control, etc. while other ports are active!
- PROVEN RELIABILITY — TC-5s are in use world-wide
- EXCELLENT SAVINGS — The cost-effective solution to your communications needs
- ELIMINATES ERRORS — Fully automatic error correction
- COMPREHENSIVE DIAGNOSTICS — Automatic self-tests, modem loop-back, and built-in error counters
- FAST, FRIENDLY PROGRAMMING — Program all parameters from either unit, using only the English display and three front-panel buttons-ALL in just seconds!
- BUILT-IN SYSTEM MONITORS — Real-time signal and data displays

For further information and the sales office for your area Call toll-free (800) 235-6066 or in Calif. (805) 964-9852

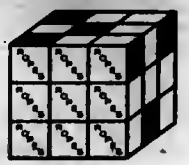
ComDesign

ComDesign, Inc.
751 South Kellogg Avenue
Goleta, California 93117

ROPES

HAS THE SOLUTION TO ON-LINE PRINTING UNDER CICS

Remote On-line Print Executive System



FEATURES:

- Device-independent application programming
- Flexible report routing and control
- Full user-management of printer network
- On-line and batch report generation
- Command and Macro level support
- Extensive user documentation
- Complete recovery from CICS and printer outages
- JES and POWER retrieval also available

AXIOS PRODUCTS, INC.
2364 Middle Country Road
Centereach, NY 11720

CALL NOW FOR FREE TRIAL 516-588-5461

Azrex Offers Updated Version Of 'AZ7' Report Writer Package

BURLINGTON, Mass. — An updated version of Azrex, Inc.'s AZ7 report writer/data management software package is available.

The AZ7 can be used as a standalone or interface with standard time-sharing subsystems, including Honeywell, Inc.'s Gcos/TSS, which runs on Honeywell's Level 6 system, according to the vendor.

The package reportedly includes a user-defined I/O function; a Call capability, which enables the user to incorporate user-written subroutines; and the ability to handle packed binary-code decimal data.

Price for the enhanced AZ7 ranges from $14,000 to $24,000, depending on options purchased. The AZ7 is available from Azrex, 3 Mountain Road, Burlington, Mass. 01803.

'Sofsearch' Tracks Custom Reports

SAN ANTONIO, Texas — A software locator service is available from CCS, Inc.

Sofsearch identifies and provides custom reports on all available software products that meet up to five sets of user-specified selection criteria, such as software/application functional type desired, computer system used or considered and industry/activity to be served.

Each report is said to provide the software product name, supplier address and contact information, general description and price. Reports are updated quarterly.

A one-year subscription costs $125. Special one-time reports are available at an incremental cost of $15. CCS can be reached through P.O. Box 5276, San Antonio, Texas 78201.

Directory Covers On-Line Services

DELRAN, N.J. — Datapro Research Corp. has introduced an information service for locating, evaluating and selecting on-line services and data bases.

The *Datapro Director of On-Line Services* contains more than 100 on-line services and 500 data bases indexed by product, vendor, application and current pricing. Each product is cross-indexed to all its related listings for ease of access.

Commercial on-line services are indexed by supplier as well as special industry applications. Data bases are indexed by name, abbreviation or acronym. All supplier names, addresses, telephone numbers and key personnel are listed separately in a detailed company index.

The directory costs $340 and includes two loose-leaf volumes, 12 monthly update supplements, 12 monthly newsletters and use of Datapro's telephone inquiry service, Datapro said from 1805 Underwood Blvd., Delran, N.J. 08075.

Honeywell 'Help' Lists Applications Program

WALTHAM, Mass. — Honeywell, Inc. has announced the Honeywell Exchange Library Program (Help), a listing of the applications programs that run on most of the firm's processors.

The referral program lists a selection of applications and systems software products developed by third-party software houses as well as by Honeywell. The Help package evaluates each program submitted according to a multilevel certification and quality-control process, Honeywell said.

The Help package is an extension of Honeywell's Applications Reference Index, introduced in 1977. The package is offered free and will be available in June. Programs listed in the directory range from $100 to $175,000, the vendor said from 200 Smith St., Waltham, Mass. 02154.

Honeywell Mini Gets 'ICS Payroll'

PHOENIX — Independent Computer Systems, Inc. (ICS) has announced the availability of payroll application software for the Honeywell, Inc. Level 6/DPS 6 minicomputer running under the Honeywell Gcos MOD 400 operating system.

ICS Payroll is an on-line interactive system reportedly designed to be used by non-DPers. This software allows for multiple payroll and multiple company control of employee pay records, the vendor said. Features include on-line maintenance, time posting, edit reports, multiple deductions and parameter-driven tac tables.

ICS Payroll can be purchased for $5,000 from ICS, Suite 106, 8686 N. Central, Phoenix, Ariz. 85020.

WHEN IT COMES TO YOUR CAREER, WE THINK STATE OF MIND IS AS IMPORTANT AS STATE OF THE ART

These days, you can't get ahead by staying behind.

That's why we have multiple data centers with 3081s. And why we're involved in automation strategies, as well as with projects in teleconferencing, electronic mail, voice and data communications.

So if you're interested in working in an environment that's state of the art, you know we're committed.

But what you don't know is, we're just as committed to your state of mind.

That means we provide training, job rotations and exceptional opportunities to move up. You help shape your career by applying for development programs and work experiences that make you more promotable.

And now is the best time to start with us. Because we're growing at top speed, and we need the kind of people who can move just as fast.

But at Connecticut General, your state of mind isn't all business. Our headquarters are on over 500 acres of country. You can jog, run a fitness course, play tennis, volleyball or bowl. And if you like, you can have three meals a day in our cafeteria.

So you can see our human services are as advanced as our information services.

Find out more about working at Connecticut General, our benefits and relocation program. Write for our brochure on information services careers: Corporate Information Services, Dept. 202 CW-10, Connecticut General Life Insurance Company, Hartford, CT 06152.

CONNECTICUT GENERAL
WE KEEP SOME PRETTY TOUGH CUSTOMERS HAPPY.
Equal Opportunity Employer M/F/HC

On-Line Data Entry Facility For DEC's VAX Runs on PDP-11

TULSA, Okla. — Viking Software Services, Inc.'a on-line forms development and data entry utility for Digital Equipment Corp. VAX computers is now available for the DEC PDP-11 running under the RSX-11M operating system.

The Viking Forms Manager is a software product used to create, operate and maintain end-user and data entry applications programs in an interactive environment, the vendor said. The software features a Forms Development Facility, Execution Time Subroutine Library, Data Entry System and an Exerciser — a program that tests the efficiencies of the forms before programs are written.

The license fee for the software is $8,000, including maintenance and enhancements for one year. Viking is located at Suite 820, 2800 Center Building, 2815 E. Skeliy Drive, Tulsa, Okla. 74105.

ATTENTION DEC USERS

WHEN YOU SPEAK SATURN LISTENS

and we pick up the tab when you pick up the phone

[redacted]

WORD PROCESSING/LIST PROCESSING SUPPORTED SOFTWARE FOR YOUR DEC

FOR ADDITIONAL INFORMATION CALL OR WRITE

SATURN SYSTEMS, INC.

6875 Washington Avenue South, Suite 218, Minneapolis, MN 55435

Is YOUR DP Foundation as solid as this?

If not, you need TTI's NEW Fundamentals Seminars

The Great Egyptian Pyramids, the Eiffel Tower, and the World Trade Center all have one thing in common: a solid foundation. When construction plans are drawn, it's natural to consider the fundamentals needed to create a foundation that will withstand the weight, the weather and other unexpected events. However, when corporations are adopting a new communication network or data structure, they often do not take the fundamentals into consideration.

Today's networks, data structures, and database management systems need to have the flexibility and intuitiveness to meet both your current and future corporate needs. Begin without the fundamentals, and you'll never really start. Oh, you may be okay in the short run, but in the long run, you'll be back to square one.

This season, TTI offers 3 NEW courses that detail the fundamentals of Data Base Management, Data Structures and Data Communications. Each course features a recognized expert in the field that will help you develop a fundamental foundation from which your network, system, or structure can grow.

Fundamentals of Data Communications April 26–28, San Francisco

Learn the basics of data communications from the ground up. Dr. David Retz will explain traditional and modern technology and the alternatives available for establishing effective corporate communications.

Fundamentals of Database Management May 10–12, Washington, D.C.

Discover the full potential of Database Management Systems (DBMS). Harvard's Dr. Philip Bernstein will detail the interface of a DBMS through a decomposition of the system. As he analyzes each component, he will also explain the implementation procedures.

Fundamentals of Data Structures May 24–26, Washington, D.C.

Learn to use your data so that it can be effectively retrieved, manipulated and stored. Dr. Hanan Samet will discuss the fundamental concepts of data structuring. This will be followed by an examination of data storage management and data accessing.

Transform your system into an eternal pyramid!
And ask about the Great Spring Seminar Giveaway.

Please send me more information about FUNDAMENTALS courses.

NAME
COMPANY NAME
ADDRESS
CITY/STATE/ZIP
TELEPHONE

TRAINING INSTITUTE
10 [illegible] ST., SANTA MONICA, CA 90405 (213) 394-8305

CW 4/82

Design/Documentation Tool Designed For DEC VAX, Decsystem, Prime

LA JOLLA, Calif. — Science Applications, Inc. has released a software design and documentation package (SAI-SDDL) designed for Digital Equipment Corp. VAX, Decsystem-10 and Decsystem-20 and Prime Computer, Inc. computers.

SAI-SDDL reportedly can access both design pseudocode and actual source code. The program supplies a table of contents, invocation hierarchy chart and a cross-reference listing of modules, a company spokesman said.

User-controlled features include keyword specification, additional cross-referencing, title and text boxing and format specification for input and output, according to the company spokesman.

SAI-SDDL licenses for $5,000 from 1200 Prospect St., P.O. Box 1454DH, La Jolla, Calif. 92038.

Report Writer Option Targets DEC PDP-11/70, LSI-11 Users

PORTLAND, Ore. — Interactive Technology, Inc. has developed a report writer option to its User Real-time Data Management for users of Digital Equipment Corp.'s PDP-11/70 and LSI-11 microprocessors running under RT-11, TSX-Plus, RSX-11 and RST/E operating systems.

Mathematical capabilities are included, the vendor said, which allow for subtotaling, totaling or calculating percentages while a report is being printed. Utility functions such as the generation of a diagnostic listing of report sequences are also included.

Report-writing capabilities include columnar reports, mailing label reports and freeform report, where multiple lines are used to print information from each selected record in a data file, the vendor said. The Report Writer II can also be used to print reports on preprinted forms such as paychecks and invoices, according to the firm.

Report Writer II is available on a CPU license basis for $750 from the vendor, Suite 103, 1225 N.W. Murray Road, Portland, Ore. 97229.

Aydin Graphics Instruction Set Compatible With 5216 Display

FORT WASHINGTON, Pa. — Aydin Controls has announced a three-dimensional graphics instruction set compatible with its 5216 Display Computer system.

The Aygraf/3D can reportedly be used as a stand-alone system with the 5216 or tied into a host computer including Digital Equipment Corp.'a PDP-11 and VAX, Data General Corp.'a Nova and Eclipse and Hewlett-Packard Co.'a 1000 series, the vendor said.

The system reportedly is user programmable with Forth or Intel Corp. 8086 assembly language. The user can reportedly create edit display and store graphics objects in the hierarchical, three-dimensional data base.

The package is said to have 64 fundamental instructions that fall into three categories: graphics commands for a world coordinate system, data base management based on tree-structured hierarchy and interactive commands, which provide user programming and picking functions.

The Aygraf/3D enables the user to scale, rotate, translate, window, create perspective drawings, display basic primitives (surface, prisms, spheres, vectors and text), pick logical entities and support hue intensity saturation color schemes, the vendor said.

Price for the Aygraf/3D is $6,000 and is available from Aydin Controls, 414 Commerce Drive, Fort Washington, Pa. 19034.

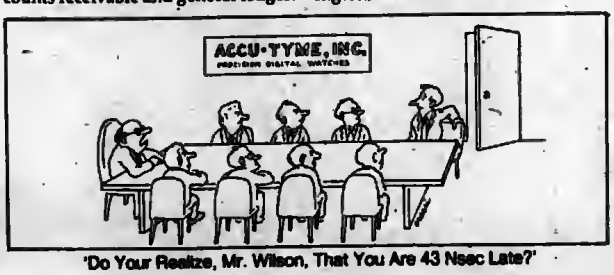
NEC Announces Tool for Astra Line

LEXINGTON, Mass. — NEC Information Systems, Inc. has announced Construction Profit Management System for its Astra line of small business systems.

Developed by Adata Corp. of Indianapolis, the package features a series of modules, including job cost control, payroll, accounts payable, accounts receivable and general ledger.

The package is said to aid the contractor in supplying information to monitor costs, make bidding decisions, control multiple phases of construction, manage available resources and provide financial data to creditors, the vendor said.

The package costs $20,000, the vendor said from 5 Militia Drive, Lexington, Mass. 02173.



'Do You Realize, Mr. Wilson, That You Are 43 Nsec Late?'

Software Transfers Files Between Operating Systems

IRVINE, Calif. — Unique Automation Products Co. has announced software for file transfers and media conversion between similar and dissimilar operating systems.

The initial release of Uaplink supports Digital Equipment Corp. RT-11 and RSX-11M operating systems and S & H Computer Systems, Inc. TSX-Plus operating systems. Users initiate requests to a local control module, which communicates with a host module executing in the remote computer, the vendor explained.

When ready to transfer binary or text files, the host module is started and Uaplink shifts into protocol mode. Users can send, receive, delete, check or rename disk files.

Control module prices range from $375 to $675, and host module prices range from $950 to $1,850, depending on users' operating systems, a spokesman said from Suite L, 17922 Sky Park Circle, Irvine, Calif. 92714.

'Rims/MPG' Out In Version 4.0

PITTSBURGH, Pa. — Information and Systems Research, Inc. has announced Version 4.0 of its Rims/MPG, an applications program generator for Digital Equipment Corp. PDP-11 and VAX series processors.

The release includes three additional modules: Rims/Graf, a graphics program generator; Rims/Menu, a menu program generator; and Rims/ORG, a reorganization program generator, the firm said.

In addition, the original Rims/MPG was enhanced to include additional data dictionary, reporting and program-generation features, according to the vendor.

The package costs between $5,000 and $10,000, the vendor said from 410 Rouser Road, Coraopolis, Pa. 15108.

'Info' Available For PDP-11s

WELLESLEY, Mass. — Henco, Inc. has introduced a version of its Info application development and relational data base management software for Digital Equipment Corp. PDP-11 systems running under RSX-11M.

Info's features include a screen builder that permits users to utilize information from up to 10 different data files, data entry and update capabilities, a query language, a report writer, a programming language and a relational data base management system, the vendor said.

Also available from the vendor is an Info-Interface to Muse. Muse is said to be a full-screen, cursor-controlled word processor from Marc Software International, Inc. available for the PDP-11.

The PDP-11 version of Info is available for $7,500 from Henco, 35 Walnut St., Wellesley, Mass. 02181.

Four Phase Users Get Mailing Label Package

OVERLAND PARK, Kan. — JL Consulting Services, Inc. has announced a contribution and mailing label package for Four Phase Systems, Inc. processors.

The package features year-to-date accounting for contributions and gifts. It also provides mailing labels for solicitation. The package was designed primarily for use in the hospital industry, but the vendor said it can be used in other areas as well.

The package costs $1,995, the vendor said from Suite 310, 8700 Indian Creek Pkwy., Overland Park, Kan. 66210.

Auditing Package Built for Fortran

GOLETA, Calif. — An auditing package for Ansi-77 Fortan programs running on Digital Equipment Corp., Data General Corp., IBM and Gould, Inc. systems was announced here by Softool Corp.

Fortran Auditor 77 was designed to generate program documentation, detect errors and serve as a quality assurance tool.

The software comes with an interactive tutorial program and user manual. A permanent license fee for this product costs $16,000, and lease terms of $700/mo are available, according to the vendor at 340 S. Kellogg Ave., Goleta, Calif. 93117.

Interface Ties To DEC's RMS

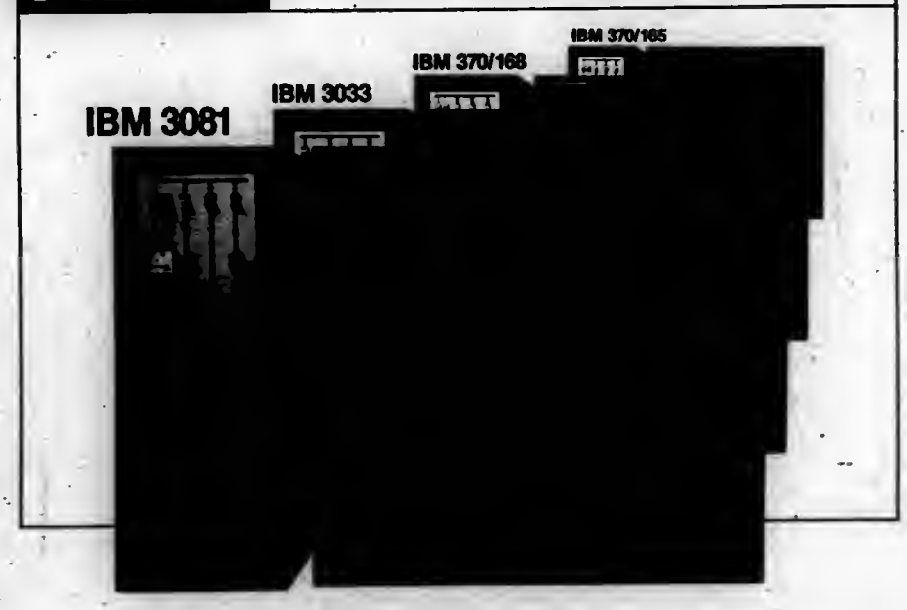
BURNABY, Canada — Valley Software, Inc. has introduced an interface to Digital Equipment Corp.'s RMS file-handling package designed to enable users of Oregon Software, Inc.'s Pascal-1 or Pascal-2 to access this product on DEC PDP-11 or LSI-11 systems runnping under RSTS/E.

The features of the RMS/Pascal Interface reportedly include 25 interface routines; support for indexed, relative and sequential files; programming of up to 2,000 lines of code without overlays and program internal dump routines.

Pascal-1 and Pascal-2 are available for $1,440 each from Valley Software, 390-6400 Roberts St., Burnaby, B.C., Canada V5G 4G2.

PILLER

POWER SYSTEMS FOR COMPUTERS



Then and today...
PILLER IS STILL NO. 1

Announcing the PILLER 40 KVA power system for IBM system 3081*...the only 40 KVA power system that meets IBM specifications—and—incorporates PILLER's exclusive paralleling design.

This permits redundant operation of two or more PILLER 40 KVA Frequency Converters to support single or multiple 3081 CPU's, expandable on a modular basis.

And as usual, the PILLER 40 KVA Frequency Converters offer a number of other exclusive advantages not currently available in other power units...including dual input voltage capability (either 208V or 460V input)...and a special startup system which reduces surge demands to half those of other frequency converters.

*Also meets specifications for AMDAHL System 580.

All this at a cost that is competitive with the IBM Model 3089 power unit.

Today, as then, PILLER offers more 60 Hz Motor Generator and 415 Hz Frequency Converter models than any other manufacturer, plus a full range of paralleling, power distribution and control equipment required for total power system integration.

No wonder PILLER remains the NO. 1 CHOICE in power protection for IBM CPU's, with more than 3,000 systems installed coast-to-coast.

Like to know more? Contact Murray Lazar, Director of Marketing. (914) 355-6741.

CONTROL SYSTEMS, INC.

IBM, Compatible Processors Gain DES Simulator

HOUSTON — Houston Information Systems, Inc. has announced a Data Encryption Standard (DES) algorithm simulator for IBM 370, 30 series, 3081, 4300 and compatible processors.

Written in 370 assembly language, the package uses standard linkage conventions. It can be used on programs written in other languages if those languages are able to call on IBM assembler programs, the vendor said.

The package costs $2,500, the vendor said from Suite A1, 5151 Mitchelldale, Houston, Texas 77092.

Random Notes

DEC RSTS/E Installations Receive Update Service

LOS ALAMITOS, Calif. — Software Techniques, Inc. has announced a Product Update Service for its Diskit disk management "tool kit" for Digital Equipment Corp. RSTS/E installations.

The services, available to subscribers, reportedly include a one-year extended warranty, product maintenance service by mail and automatic license for new versions.

A one-year subscription costs $195 from Suite 101, 5242 Katella Ave., Los Alamitos, Calif. 90720

IBM 5280 Users Offered Interactive Financial Tool

OMAHA, Neb. — An interactive financial modeling package for users of IBM 5280 computer systems has been announced here.

Calc/52, from MHA Software Service, Inc., offers features including recalculation, amortization, averaging and summing to aid management in financial projections. Hard copy can also be printed from results.

The Calc/52 package licenses for $1,500 from MHA, 7117 Farnam St., Omaha, Neb. 68132.

Model-Building Package Announced for TI Minis

ROSWELL, Ga. — Antech, Inc. has announced Cope-II, a financial planning model-building package for Texas Instruments Corp. DS990 Model 1 minicomputers.

The package can be used to develop financial models, prepare formatted reports and handle three-dimensional models, the vendor said.

The package costs $750, from 788 Myrtle St., Roswell, Ga. 30075.

ISE is an International Consortium of the World's Leading Software and Consulting Firms, Representing Over 5,000 Professionals Around the World

Remote 3270s Gain Access To VM Hosts

NEW YORK — A software package that enables users at remote locations to access IBM 3270 applications and program development tools running on a host IBM VM system was announced here by Cokarinos Computer Consultants.

VM/SP Multipoint 3270 Enhancements reportedly permits up to 32 IBM 3270 cluster controllers to access an IBM VM/SP host system over the same binary synchronous communications line.

The package is said to make it possible to design a VM communications network with a practically unlimited number of 3270 clusters, removing the standard VM limit of 16 point-to-point clusters.

Reducing Network Costs

The vendor claimed the package can reduce overall network costs by cutting leased-line mileage charges and requires fewer modems and fewer communications ports to serve a given number of 3270 clusters.

VM/SP Multipoint 3270 Enhancements eases network control by identifying each remote 3270 cluster with a user-defined nodename, the vendor said. The nodename appears in relevant console messages and may be used in operator commands.

The software is said to run on any CPU that supports the VM/SP operating system. The multipoint biaynchronoua lines can attach to either IBM's 370 communications controller (for IBM's 370/148 or larger systems) or its Integrated Communication Adapter (ICA) (for IBM's 370/135, 370/138, 4321 and 4331).

VM/SP Multipoint 3270 Enhancements is available for a one-time license fee of $7,500 from Cokarinos Computer Consultants, 212 W. 79th St., New York, N.Y. 10024.

For Voice, Video, Data

GE Subsidiary Offers Local Net

SUNNYVALE, Calif. — Intersil Systems, Inc., a subsidiary of General Electric Co., plans to begin marketing a local-area network in June, which it said will accommodate voice, video and data and will integrate factory with office information processing applications.

Key features of GEnet include:

- It will provide up to 20 broadband transmission channels on a single, standard CATV coaxial cable, each capable of transmitting at up to 5M bit/sec.
- The network protocol will remain compatible with proposed local-area network atandards being developed by the Institute of Electrical and Electronics Engineers (IEEE). Initially, GEnet will support carrier sense multiple access with collision detection, but an alternate channel allocation scheme known as token passing will be offered later this year.
- Each bus interface unit has four ports; each port can accommodate a 9,600 bit/sec data stream subdivided among as many as four terminals. Asynchronous and synchronous terminals can share the same port.
- By June, GE plans to complete development of a transmission protocol encompassing the first four levels of the International Standards Organization's Open Systems Interconnection (OSI) model. This initial capability will allow users to transmit and receive both datagrams and virtual calls, as defined in the proposed IEEE atandard.
- Protocols for the remaining OSI levels (5 to 7) are under development. An Intersil spokesman predicted they would be available "by early next year."
- Initially, RS-232C and RS-422-compatible asynchronous terminals, plus devices that support Decnet, GRTS, Synchronous Data Link Control and High-Level Data Link Control synchronous protocols will be connectable to GEnet.

GEnet Offered as Turnkey

Intersil will offer GEnet on a turnkey basis; factory installation and maintenance will be performed by GE's Installation and Service Engineering Division, which has field offices nationwide.

A typical network with 20 bus interface units will cost approximately $100,000 installed, depending on options selected and facility site requirements, Intersil said.

According to Octavio Martinez, Intersil's senior vice-president, GEnet was intended to address three applications areas: those confined to a production area, such as computer-aided design; those confined to an office or office building; and those involving information interchange between factory and office. In each case, he said, the applications particularly suited to GEnet require on-line information transfer among a large number of largely dissimilar terminals and computers.

Aside from the protocol conversion capability included in the basic GEnet, Martinez added, information interchange with additional devices will be possible by adding Intersil's Versatile Communications Controller (VCC), an already developed device that can be custom-programmed to interface GEnet with any of several attached terminals.

Alternatively, when configured as a gateway, a VCC can interface GEnet to "many" other networks, the company claimed.

Martinez said the initial market for GEnet will be major companies building new plants or modernizing their manufacturing facilities, as well as banks, insurance companies and multitenant office buildings.

Intersil is located at 1275 Hammerwood Ave., Sunnyvale, Calif. 94086.

Office (Left) and Factory (Right) Bus Interface Units

QWIKTERM

- LA 36 — DECwriter II $595. plus options
- TI 765 — Bubble memory $1700.
- Perkins Elmer Owl 1200 — CRT $995.
- Techtran 8400 — Cassette Recorder $250.
- AJ 242A — Acoustic Coupler $150.
- ADDS Consul 980 — CRT $495.
- Execuport 300 — Portable $495.
- Diablo 1640 or 1650 — Like new $2295.
- LA 34 DA $695. — LA 34 AA $795.
- TTY 43 — $695.

Fully reconditioned. Limited quantities available. Short or long term leases on both new and reconditioned terminals, or on outright purchases. Call us for information.

Boston (617) 246-1065 · Chicago (312) 595-7733 · Los Angeles (714) 521-7169 · New York (212) 564-7731 · San Francisco (415) 461-6823 · Washington, D.C. (703) 532-1210

Radio Shack's TRS-80 Model II Microcomputer Is the Ideal Multi-Purpose Workstation

Our Most Popular Business Computer Is a Versatile System That's Designed To Accomplish A Wide Variety of Tasks.

$3899 Includes:

- 4 MHz Z-80A Processor
- DMA and Vectored Interrupt
- Two RS-232C Ports
- Parallel Printer Port
- 64K RAM
- One Double-Density 486K 8-Inch Drive
- 76-Key Professional Keyboard

Radio Shack
COMPUTER CENTER

Tell me more! Send me a free TRS-80 Computer Catalog.

Mail To: Radio Shack, Dept. 82-A-150
1300 One Tandy Center, Fort Worth, Texas 76102

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

Starnet II, Local Network, Features 16 Ports

DENVER — A microprocessor-based local-area network said to support most industry-standard interfaces has been announced by the Starnet Data Systems Division of Protex Industries, Inc.

The Starnet II Local Network features 16 ports with the capability for expansion through internet connections with other Starnet II units. Other features include on-line status report, network security with special privileges assigned by the system operator and software-selectable transmission rates, the vendor said.

Also featured are transmission speed mismatch compensation, code set conversion and protocol conversion. Remote devices are said to be served by autodial/autoanswer integral Bell 103- and 212-compatible modems. Each port will buffer up to 256 char.

Each customized unit, including site installation, is priced at $19,495, a Starnet spokesman said from 1331 W. Evans, Denver, Colo. 80223.

ACC Packages Connect to Ecom

SANTA BARBARA, Calif. — Associated Computer Consultants (ACC) has released three protocol packages designed to connect users with the U.S. Postal Service's Electronic Computer-Originated Mail (Ecom) service, which is based on Digital Equipment Corp.'s PDP-11 or VAX processors.

The three protocols are Ecom/3780, Ecom/X.25 and Ecom/asynchronous. The packages consist of RSX-11M or VMS software with one or two hex-width boards with insert in a DEC Unibus backplane, according to the vendor.

The Ecom/3780 packages reportedly support the IBM 3780 and 2780 protocols for either dial-up or dedicated-access Ecom users. It requires a hex slot in the DEC Unibus backplane for its single-circuit board. Device-driver software for installation in the PDP-11 or VAX is included.

The Ecom/X.25 is said to enable individuals to establish calls to remote serving post offices (SPO) through use of an X.25 packet-switched network. The Ecom/X.25 package consists of a software source code for a multichannel driver that reportedly resides in the PDP-11 or VAX operating system (RSX-11M or VMS) and two interconnected hex-width circuit boards, which insert in the Unibus backplane.

Two asynchronous dial-up ports for PDP-11 or VAX users are available with the Ecom/Asynch package, the vendor said. The package consists of driver software for the PDP-11 or VAX plus one hex-width board of insertion into the Unibus backplane that allows the user to transmit letters from an on-line storage medium via modem to the individual SPOs.

Prices for the Ecom packages are $9,000 for the 3780, $11,000 for the X.25 and $5,500 for the asynch, from ACC at 228 E. Cota St., Santa Barbara, Calif. 93101.

Single-Board Ethernet Controller Interfaces Multibus Systems

CHELMSFORD, Mass. — Interlan, Inc. has unveiled an intelligent single-board Ethernet controller, which reportedly contains all the data communications logic required for interfacing Multibus-based systems to the Ethernet local-area network.

The Model NI3010 reportedly performs the specified data link and physical channel functions that permit up to 1,024 stations to communicate at 10M bit/sec over distances to 2,500 meters on a shared coaxial cable transmission medium. It performs all of the required Ethernet data link functions.

On transmission, the NI3010 formats frames and performs the carrier sense multiple access with collision detection (CSMA/CD) transmit link management functions of collision detection, backoff timing and retransmission required to deliver frames onto the network successfully.

When not transmitting, the controller continuously listens to the network for the frame traffic intended for it, according to the vendor spokesman.

The single-unit price for the NI3010 is $2,990, Interlan said from 160 Turnpike Road, Chelmsford, Mass. 01824.

Digilog Unveils Desktop Micro

MONTGOMERYVILLE, Pa. — Digilog, Inc. has announced a desktop microcomputer with diskette storage designed to allow the firm's Network Supervisory System to control local and remote sites from a single point.

The Network Control Console reportedly also provides an active interface to remote alarming, protocol monitoring and switching capabilities.

The console has audible and visible alarm indicators that report network malfunctions, according to the vendor.

The console costs $5,500 from the firm at 1370 Welsh Road, Montgomeryville, Pa. 18936.

Graphics Interface '82

Constellation Hotel, Toronto, Ontario, May 17-21, 1982

A CONFERENCE ON INTERACTIVE COMPUTER GRAPHICS

Graphics Interface '82 is a 5-day computer graphics event combining applications-oriented tutorials with conference-style panel discussions, presentations of technical papers and exhibits. It is designed to educate and inform not only those currently working in the field, but anyone who wants to become involved in computer graphic applications and systems.

Experts from North America and Europe will participate in the conference as instructors and speakers, including representatives from government, business, industry and education sectors.

For a complete information package, including a detailed schedule of events, fee information and registration form, complete the coupon and mail it to Graphics Interface '82, 961 Eglinton Avenue East, Suite 200, Toronto, Ontario M4G 4B5. Or call (416) 424-4758/424-3482.

TUTORIALS

MAY 17: Introduction to Graphics I; Digital Image Processing; Computer-Aided Design I; Graphic Design; Videotex

MAY 18: Introduction to Graphics II; Raster Graphics; Computer-Aided Design II; User Interface Design; Management Graphics

TECHNICAL PROGRAM

MAY 19: Human/Computer Interaction; Graphics Algorithms; Speech Synthesis and Understanding; Graphics Systems; Pattern Recognition and Image Processing; Videotex Panel

MAY 20: CAD/CAM; Mapping and Spatial Information; Artist in the Lab Panel; Business Graphics

MAY 21: Human Factors; Graphics Hardware; Animation and Modelling; Lab Report Session

EXHIBITS OPEN MAY 18-20

Please send me more information on Graphics Interface '82.

Mail to: Graphics Interface '82, 961 Eglinton Avenue East, Suite 200, Toronto, Ontario M4G 4B5

Name _____

Title _____

Organization _____

Address _____

City _____ Province _____

Postal Code _____ Telephone ( ) _____

NCGA National Computer Graphics Association of Canada

Canadian Man-Computer Communications Society

Sponsored by the National Computer Graphics Association of Canada and the Canadian Man-Computer Communications Society with support from I.E.E.E., the Canadian Image Processing and Pattern Recognition Society and others.

GDC Unveils Enhanced Netcon-5, Statistical Mux and LSI Modem

DANBURY, Conn. — In a recent series of announcements, General Datacomm Industries, Inc. (GDC) introduced enhancements to its Netcon-5 Network Management System, added a family of statistical multiplexers and unveiled a large-scale integration (LSI) modem product.

The enhancements to the Netcon-5 system reportedly provide users with statistical reports reflecting network activities in both logging and graphics format. They include a user-definable Station Data File and a Problem Ticket Report Generation system for logging and tracking network events and personnel activity.

The upgraded system is said to feature a "universal search capability," which allows the operator to key in on any one or multiple entries by generic name or number to extract file data. The file is interactive with other diagnostic and support functions and reportedly simplifies the task of network supervision and decision making by automating test control and restoral procedures. The upgraded Netcon-5 system costs $36,960.

The Statkat family of 4-, 8-, 12- and 16-channel statistical multiplexers features 15 selectable channel rates plus automatic transmission rate detection at 110 to 1,200 bit/sec and a composite rate of up to 19.2K bit/sec synchronous or 1,200-, 1,800- or 9,600- bit/sec asynchronous, the vendor said. GDC claimed they offer maximum multiplexing efficiency over a single telephone line with full automatic request query error protection.

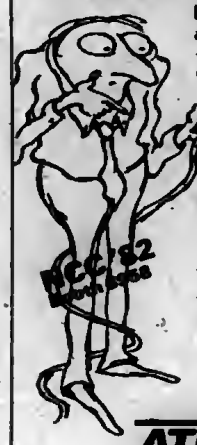
The Statkats also are said to feature down-stream loading, four full-duplex EIA channel controls, system diagnostics and status indicators, low power drain and simple installation and operation. The multiplexers cost between $1,945 and $4,830, depending on the number of channels.

The LSI modem, the 208B/A, provides 4,800 bit/sec full-duplex data transmission over unconditioned four-wire voice-grade circuits or half-duplex operation over the two-wire switched network. It is line-compatible with all Bell Laboratories 208 and 2048 modems and operates over a private-line service on either point-to-point or multipoint circuits and over full or half-duplex switched-network circuits.

The 208B/A is also compatible with GDC's 801A/C and Western Electric's 801A/C-type automatic calling units.

This unit is priced at $1,760, the vendor said from One Kennedy Ave., Danbury, Conn. 06810.

USERS OF DGMV8000 DEC11/70, PDP-11 VAX PRIME 750, HP 3000



What are you going to do about power conditioning?

Your mini-computer needs power conditioning but what solution are you going to buy? A costly and finicky UPS or an inexpensive (and often ineffective) transformer/regulator?

The effective and affordable choice is the ATLAS MPC Mini Power Conditioner.* The ATLAS MPC uses the superior power conditioning of a motor generator to provide 100% clean computer grade power free from flickers, transients, brownouts, instantaneous sags and surges, under and over voltage conditions.

And only the ATLAS MPC offers compact sizing in a 30" x 34" floor space, computer grade ground, a circuit breaker panel with distribution cables, a handsome soundproof cabinet, fastest delivery and the lowest cost! That's why ATLAS is the industry leader in rotary power systems.

Call or write for ATLAS MPC literature and application information.

*MPC Mini Power Conditioner available 10 to 18KVA. Larger Power Conditioners available to 500KVA

ATLAS ENERGY SYSTEMS 9457 Rush Street El Monte CA 91733 (213) 575 0755

C-STAR...

U.S. Cities Get Telex Services

NEW YORK — Domestic telex and data communications services are being offered in 71 U.S. cities by ITT World Communications, Inc. (ITT Worldcom).

A division of ITT Corp., ITT Worldcom is one of five international carriers providing telex and data communications services between the U.S. and more than 200 foreign countries, the firm explained.

Domestic operations were formerly confined to the state of New York, but now ITT customers can communicate at a cost of 35 cent/min to other U.S. cities as well as to international concerns, the firm said.

ITT Worldcom is headquartered at 67 Broad St., New York, N.Y. 10004.

Zilog Package Provides Local-Area Net Link

CAMPBELL, Calif. — Zilog, Inc. has introduced a communications package that reportedly provides a high-speed local-area network link between multiple units of the vendor's System 8000, a 16-bit microprocessor family based on the Unix operating system.

Z-Net II includes a communications controller board, network transceiver and an extended version of the U-Net software developed by 3Com Corp. U-Net, which constitutes the higher level protocol portion of the Z-Net II software, also allows other Unix-based machines to communicate with each other and System 8000s using conventional lower speed data communications techniques.

Z-Net II makes use of network transceivers, U-Net software and a network interface board developed by Zilog to connect System 8000 with the Z-Net local-area network architecture.

The package will be available in the third quarter for a $7,500 software site license fee plus $5,000 per system price, which includes a Z-Net transceiver, network interface board, cables and connectors.

Zilog is located at 10340 Bubb Road, Cupertino, Calif. 95014.

Package Designed for PBX Uses Two to Eight Channels

KIRKLAND, Wash. — Teltone Corp. is offering a two-to eight-channel package designed for private branch exchanges (PBX) with simultaneous voice and data communications on local telephone pairs wiring.

The DCS-2 features dedicated, full-duplex, asynchronous data links that reportedly run at any speed up to 9,600 bit/sec. The range of the system is limited to about 5,000 cable ft between the telephone site and PBX interface point.

If the distance between the PBX wire center and computer rooms exceeds several hundred feet, a DSC-2A system with integral multiplexers may be used that concentrates 32 channels over a telephone company T1 digital carrier or private four-wire circuit.

A complete Mini-File starter system costs approximately $1,500. Teltone can be reached through P.O. Box 657, 10801 120th Ave. N.E., Kirkland, Wash. 98033.

Data Star Offers 'Encryptor'

FAIR OAKS, Calif. — An encryption/decryption unit employing an S-100 Bus-compatible board has been unveiled by Data Star Ltd.

The Encryptor reportedly features programmed I/O for key, data, commands and states and provides supporting software for Digital Research, Inc.'s CP/M and MP/M operating systems and Phase One Systems, Inc.'s Oasis operating system.

Said to encrypt or decrypt 8 bytes in 25 μsec, the unit costs $395 from the firm at Suite G, 9700 Fair Oaks Blvd., Fair Oaks, Calif. 95628.

IBM SERIES 1

4955E 256K CPU
4959 Expansion
4963 Large Disk
4964 Diskette
4974 Printer
4975 Printer
4997 Enclosure
3101 CRT's

Price $36,000

Also Available 4973 Ptr., 4969 Tape Dr., 4979 CRT's.

URS Call George O'Gara 617/438-6300 68 Montvale Ave. Stoneham, Mass. 02180

LOCAL-AREA NETWORKS:

PRODUCTS • CONCEPTS • STANDARDS

By Kenneth Thurber

THE FIELD OF LOCAL COMMUNICATIONS hardware products has grown dramatically. It began in the early to mid-1970s with a couple of developmental-stage firms and today is an industry composed of more than 140 companies. This growth has been fueled by the proliferation of microprocessors and personal computers, the advent of new high-speed local transmission mechanisms and lower cost manufacturing equipment, as well as new perceptions of the programming environment.

The industry is expected to grow at a compounded annual rate of 60% for the next 10 years. With the rapidly growing choice of equipment and services, any company involved in local communications networks must be concerned with the new concepts and the standardization issues that confront the industry as a whole.

Before we explore these subjects, a definition might be appropriate. A local network is comprised of a number of computer devices connected to each other within a range of one mile. The purpose of the network is to provide the user with high-speed communications between the various devices. The network includes software that defines the overall distributed system. Once the basic communications mechanism is in place, additional products or services can be added to the network to suit the user's needs.

There are a number of ways to categorize the products in this industry. Figure 1 on In Depth/3 illustrates the fundamental concept of the local-area network and the role played by the local communications network. Typically, the equipment vendor provides the network interface unit, the connections to the cabling mechanisms and some low-level software. It is the user's responsibility to provide the higher levels of software and the application as per a layered structured architecture.

For example, Figure 2 on In Depth/3 illustrates the International Standards Organization (ISO) reference model for a communications system. Typically, the vendor of the local computer network product today provides levels 1, 2 and possibly 3 of the communications model. The user must provide the higher levels. In some cases, manufacturers provide complete systems — all levels of the reference model — on a limited set of applications. However, the majority of the corporations are building their products within the lower two levels and lower three levels of the reference model.

As time progresses, manufacturers will begin to provide more and more of the services associated with the

IN DEPTH

higher levels. Some manufacturers have already begun to provide such higher level services and have begun to provide such items as network administrative units, network development facilities and monitoring equipment in addition to the overall facilities associated with the network interface and the hardware of the local communications network.

Because there are more than 145 companies supplying products at various levels of this market, the products briefly described below are merely representative. They are, however, some of the more important ones.

Baseband Products

Among the products or groups of products receiving a lot of attention are those known as baseband digital local networks. These systems transmit information in a digital format on a single-channel cable system, typically a coaxial cable. They vary in speed over a wide range from a few million bit/sec to more than 50 million bit/sec.

Four products in this area have unique strategies: Ethernet, Net/One, Hyperchannel and Hyperbus.

Ethernet, cosponsored by Xerox Corp., Intel Corp. and Digital Equipment Corp., comes in a variety of forms, the most well-known of which is the Ethernet specification. Currently, it consists of Levels 1 and 2 of the ISO reference model; in early December 1981, Xerox announced Level 3 of this specification as well as some higher levels.

As many as 100 companies have announced products that will implement the connection to the Ethernet specification and will connect to the Level 1 and Level 2 Ethernet-compatible transmission mechanisms. These products provide higher levels of software, thereby providing a whole series of system concepts implemented on top of an ad hoc standard defined by a group of companies and the marketplace.

Net/One, built by Ungermann-Bass, Inc., is quite interesting because it provides for a highly flexible network interface unit and Level 3 software, a network development system and a network administrative system, so the user can build sophisticated applications.

Most important, however, the Ungermann Bass product provides the user with the ability to swap boards in the basic Network Interface Unit NIU-1A and to have a variety of network interconnects. One of the primary interconnects is a 10M bit/sec Ethernet.

A broadband system is also available, based on the same hardware. The Ungermann-Bass product provides for a connection to an RS-232 interface and provides support for IBM 3270 protocols to interface the host device or terminal to the network.

Hyperchannel is being built by Network Systems Corp. in Minneapolis as a high-speed local network designed to interface all of the world's major mainframes. Hyperchannel is a system of adapter units designed to connect mainframes from IBM, Burroughs Corp., Honeywell, Inc., Control Data Corp. and the remainder of the major manufacturers and minicomputer manufacturers in the market today. These adapters provide a 50M bit/sec transport link between mainframes.

Hyperbus, a complement to this equipment, was first shipped to beta test in August 1981. Hyperbus is a device intended to compete in the 6M bit/sec range and was designed primarily to connect lower speed equipment, minicomputers and terminals to mainframes.

Together, Hyperchannel and Hyperbus form the basic hardware capability for developing and integrating a large office system with a large computer center and for developing concepts of future storage technology, such as the back-end storage network.

PBX-Based Products

In the area of local networks based on private branch exchange (PBX) technology, approximately 20 companies are pursuing integrated voice and data technology. Two important participants are Intecom, Inc. and Rolm Corp.

Intecom builds the IBX, which provides not only a voice PBX, but also a

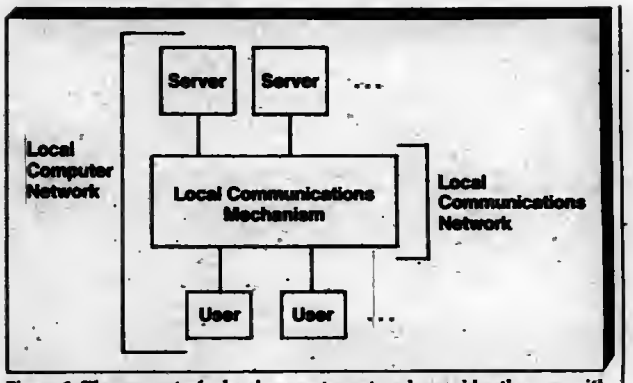


Figure 1. The concept of a local computer network provides the user with resource-sharing of services.

complete data-oriented local networking strategy on top of the voice network, allowing devices to communicate via RS-232 connections to the IBX at up to 56K bit/sec.

Release 7 software for the Rolm CBX systems provides for data communications at up to 19.2K bit/sec on the Rolm CBX. In addition, Rolm appears to be developing support capabilities in the areas of office workstations and other equipment to allow the user to build the "office of the future" on top of the CBX. The digital baseband local networks at this time are designed primarily for data transport.

The CBX provides the first illustration of a local network application in which one can conceivably and rationally integrate the concepts of both voice and data communications in the local area.

Broadband Systems

A third technique that one might want to exploit is broadband, which integrates voice, data and video. Broadband systems offer multiple channels and far greater capacity than baseband.

In the broadband area, there are approximately 15 manufacturers of local networks. Some, like Ungermann-Bass, have broadband as an adjunct or modification option on their equipment. Others, such as Sytek, Inc. and Amdax Corp., build primarily broadband local networks. Still others, such as Wang Laboratories, Inc., provide a broadband-based local network that is integral to their overall product strategy.

Sytek builds two local networks, the Localnet 20 and the Localnet 40, which were designed to connect terminals and mainframe hosts. They provide this capability by means of a set of frequency channels and by a set of multiplexing capabilities within each frequency channel, thereby allowing multiple users to coexist in a frequency channel at a given time. The frequency channels tend to be small: In Localnet 20, the capacity of each channel is on the order of 128K bit/sec; in the Localnet 40, 6M bit/sec.

In a competing approach, the Amdax Cablenet provides either a single 7M bit/sec or 14M bit/sec channel, depending on the model of equipment selected.

The Wang system design will provide a series of specialized channels oriented to allow connection of Wang equipment, other manufacturers' equipment and video.

Rings

The ring concept — in which machines are wired together in an electronic circle — is being pushed heavily by European manufacturers, although some U.S. manufacturers such as Prime Computer, Inc. and IBM also have developed rings. Ring chips are beginning to be developed in much the same way that standard chips for the Ethernet are being developed.

Layer 7	Application
Layer 6	Presentation
Layer 5	Session
Layer 4	Transport
Layer 3	Network
Layer 2	Link
Layer 1	Physical

Figure 2. The Layer Structure Of the ISO Reference Model

One of the leading manufacturers of ring systems designed to connect nonhomogeneous equipment is Logica VTS Ltd., whose Polynet product is based on the "Cambridge Ring," a specific implementation of the ring approach developed by Maurice Wilkes at Cambridge University.

There are more specialized areas in the local network product industry. For example, at least two manufacturers, Computer and Three Rivers Computer Corp., are building personal computers in which the concept of the local network is integral

GROW YOUR OWN CICS PROGRAMMERS.

The CICS programmers you need may already be working for you—because SysEd training makes even non-CICS programmers immediately productive in a CICS environment.

SysEd's challenging, "hands-on" training lets you upgrade your present programming staff, and saves the time, effort and expense of hiring new personnel.

Our experienced instructors specialize in using real-life programs and design problems. Whether the course is Command Level, Macro Level, Internals, Application Design or VSAM, we encourage students to bring in their own projects to enhance the workshop sessions.

Courses can be held at your company on your computer or at SysEd's fully-equipped classroom/computer facilities in New York City and Chicago.

For information, call Dave Shapiro (212) 889-3386

SYS-ED

ONE PARK AVENUE, NEW YORK, NY 10016 • (212) 889-3386
A Division of INTEGRATED COMPUTER SOFTWARE, INC

END DISK CONVERSIONS FOREVER.

Now all your software can use any type of DASD device—CKD or FBA—without changes to programs or JCL.

- Place ISAM, DA, BDAM or DBOMP files on FBA disks or any CKD disk
- Eliminate costly mixed-disk environments
- Use new IBM disk types without conversion
- Convert to FBA in hours rather than months
- Reduce program execution time by half
- Use any disk type for data storage without converting to VSAM
- No modifications to IBM or user software

For a free information kit describing Instant-FBA, contact the SDI office nearest you.

SDI

New Jersey (201) 569-7212
Texas (214) 241-8730
Minnesota (612) 835-6822
California (415) 572-1200

or write: 1700 S. El Camino Real, San Mateo, CA 94402

IN DEPTH

to the overall product strategy.

To gauge the size of the product market and the diversity of equipment, one need only look at the primary corporations.

Nestar Systems, Inc. builds a local network system that includes not only the communications interfaces, but also sophisticated software for file servers, printer servers, gateways, teleconferencing, electronic mail and further software offerings that can be used with Apple Computer, Inc. systems. This technology gives the user the capability to begin with simple devices and to build a sophisticated system package at a very reasonable cost.

Corvus Systems, Inc., in a similar market, has also developed a building-block approach to local networks on a variety of personal computers.

In the mid-range, 1M bit/sec to 10M bit/sec, Datapoint Corp. typifies what the future will hold. Datapoint has more than 1,500 installations of ARC systems with close to 20,000 installed ARC interfaces. In addition to the ARC local network, Datapoint provides the Lightlink, a device to provide light-wave communications between two separate local networks.

Two other products from the same company are an integrated branch exchange, the ISX, to allow for integration of the phone system or PBX with coaxial-based local networks, and an Infoswitch that is capable of connecting to a PBX from the ARC system.

Most important, Datapoint has begun to evolve from a closed to an open local network system. Prior to about October 1981, the company provided a closed local network in which only Datapoint equipment could be used.

Recently, Datapoint built its local network connection device, the resource interface module, on a single LSI chip, licensed it in a joint venture with Tandy Corp. and allowed Tandy to enter the local network system. That system can now interface not only Datapoint equipment, but also Radio Shack TRS-80-type equipment. Datapoint has also developed a mechanism that allows connection to IBM mainframes.

Computer Center of the Future

The last companies of interest are Network Systems Corp. and CDC. We have previously described the Network Systems Hyperchannel and Hyperbus. Network Systems has shipped more than 900 Hyperchannels to 135 sites and has the largest installed base of mainframe interconnections. Such mainframe-based local networks will be the basis of the computer center of the future.

The only competitor in this area is CDC, builder of the Loosely Coupled Network (LCN), which is a complete system designed for the high-speed scientific computer environment. LCN will provide both hardware and software for future mainframe local networks at sites using Cyber equipment.

Masstor Systems Corp. is providing the first back-end storage network products. A back-end storage network is meant to provide huge amounts of on-line storage in the computer center. Masstor Systems' Shared VSS has been delivered to a number of customers.

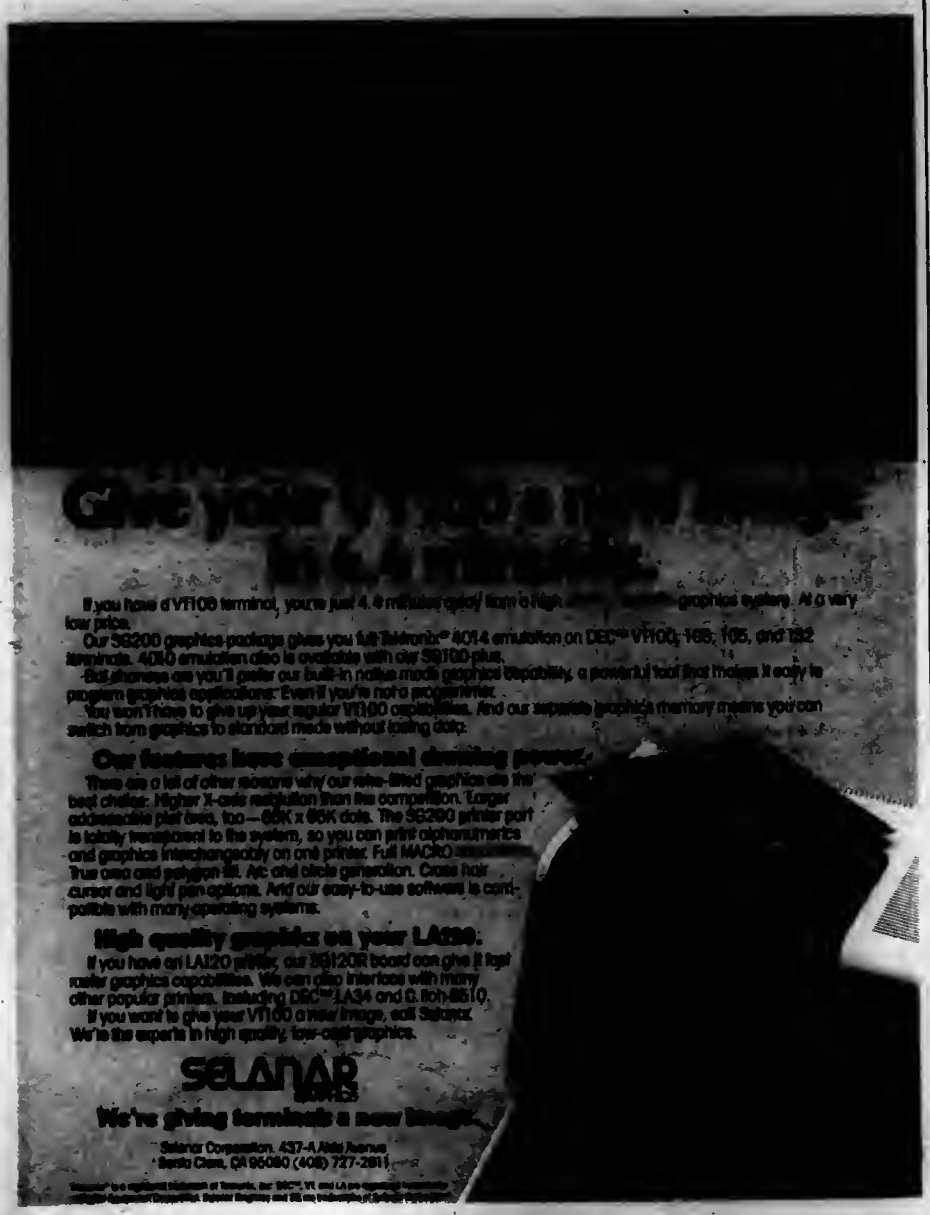
Services

Although the current state of the art tends to be limited to hardware and some minor amounts of software, local network equipment manufacturers can be expected to branch out as the industry matures. Corporations will begin to provide system integration services and OEM system design. Manufacturers themselves will begin to provide an overall complete application package built on top of a local network concept.

Standards

The area of local networks is exploding. The Institute of Electrical and Electronics Engineers' (IEEE) 802 committee is trying to develop a standard, as are other groups. However, given the technology explosion and the rapid development of the industry, standards now trail far behind the concepts, the implementation and the shipment of the hardware.

With more than 145 approaches to local networking, standards in the



Theirs:

QBE, GIS, STAIRS, APL, ADRS, SQL, Etc...

Ours:

INQUIRE®

Help users help themselves. That's the idea behind IBM's Information Center, where the data processing department will provide and maintain tools to allow users to retrieve, analyze, manipulate and present data (including textual material) more effectively.

They've got the right idea, but the wrong tools.

When productivity is all-important, why buy, learn, and support a hodge-podge of ever-changing systems in your Information Center?

With a single non-procedural language easily learned in a few hours, INQUIRE can boost user productivity, DP productivity, and support the entire decision-making process.

We've been helping companies establish information centers since 1968. Call us toll-free today to find out how.

Information Center Seminars
Omni International Hotel·Atlanta
April 20, 1982
Fontainebleau·Hilton·Miami
April 22, 1982
Call 800-336-4939 for information

Infodata

Infodata Systems Inc.
5205 Leesburg Pike
Falls Church, Virginia 22041
800-336-4939
In Virginia, call 703-578-3430
Offices in:
Dallas, Los Angeles, New York
Rochester, NY, St. Louis, Washington, DC

©1981 Infodata Systems Inc.

IN DEPTH

near future are not going to have a major impact on the market. However, as the market shakes out, standards will become an important factor, and we should begin considering their implications now. The National Bureau of Standards is pushing for standards in this area on both a national and international basis.

What Impact?

We are witnessing the spread of a new concept — not necessarily a technical revolution, but a confluence of swirling forces that will provide an overall capability for integration and sharing of resources.

The potential impact of local-network technology can be seen by looking at a very simple application, that of the DP manager using IBM 3270 cluster controllers connected to IBM terminals. Each time someone changes office or runs out of room in the cable trays, a difficult problem arises with the cabling mechanism in buildings because of all those point-to-point cable wires.

Local-network technology can solve that problem. In the state of the art today, a local network can be inserted between the terminals and the 3270 cluster controllers. The building can be wired to eliminate all those point-to-point wires.

Future Options

Today, local networks provide choices ranging from a complete office automation system to a new method for connecting terminals to an IBM mainframe. In the future, this technology will have an impact so great that specialty firms will develop to help design and wire communications structures within buildings.

This future is not too far away. Decision makers are facing situations today in which they must determine how they are going to wire new corporate headquarters to function for the next 50 to 100 years.

One solution to the problem is simple: Put in lots of conduit, twisted-pairs, fiber-optic and other types of wiring schemes. The other solution is to install a carefully selected, carefully designed local-network system.

Using the second solution, and with the integration of future services built upon this overall cable plant, the local-network industry will provide users with cost-effective solutions to their information problems.

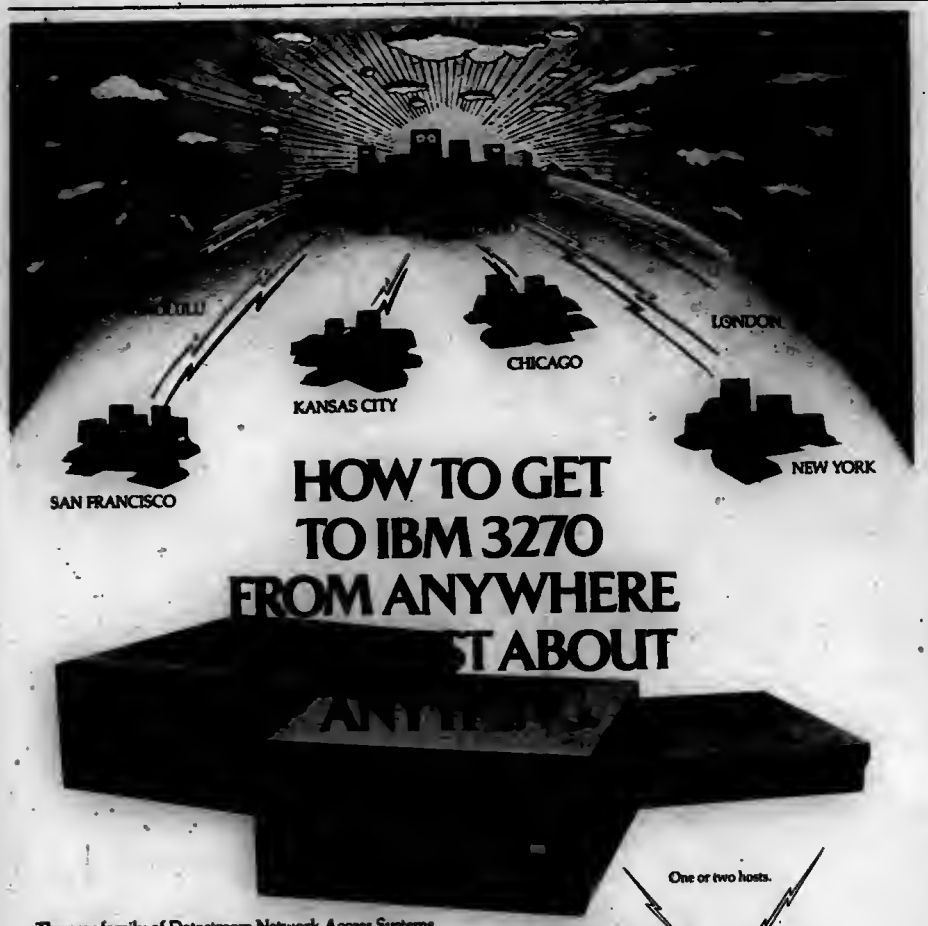
About the Author

Dr. Kenneth J. Thurber is president of the Minneapolis-based Architecture Technology Corp., a consulting firm that specializes in computer architecture, including local networks and office systems.

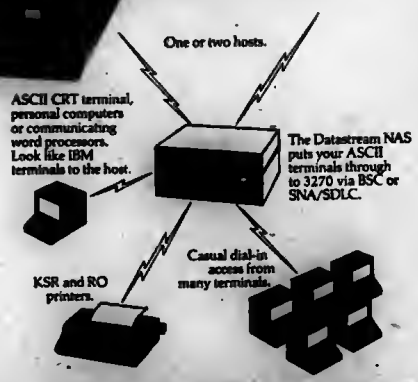
He has presented seminars at conferences such as the National Computer Conference, the International Conference on Communications, the IEEE Computer Society's annual meeting (Compcon) and the Distributed Processing Conference. He taught computer science for seven years at the University of Minnesota.

Thurber has had 12 years of industrial experience working on systems and advanced technologies. He is the editor of Office Automation Systems, Distributed Processor Communication Architecture *and* A Pragmatic View of Distributed Processing Systems.

Thurber is also editor and publisher of the monthly "Localnetter" newsletter.



The new family of Datastream Network Access Systems (NAS) lets your ASCII CRTs and printers, personal computers and communicating word processors access IBM 3270 applications programs even on a remote, dial-up basis. So that programmers, branch offices, field sales people and telecommuters will have more information than ever at their fingertips.
The NAS and ASCII terminals act as a "3270 cluster" but cost about half as much. And, since our NAS family provides remote dial-up access, which IBM doesn't, you get more network flexibility while you save money.
The T7, our popular standard, supports up to two IBM BSC lines and multiple ASCII terminals. Our new T8 is for full SNA/SDLC access and also supports multiple ASCII terminals. The new T5 pre-packages the most popular features of the T7 for the budget conscious user. Find out how a Network Access System can increase your network's productivity.
CALL US COLLECT at (408) 727-2980 or write Datastream, 1115 Space Park Drive, Santa Clara, CA 95050.



DATASTREAM

DOS

KICK IT OFF WITH

FOCUS

Source Code & JCL Conversion

ARKAY COMPUTER INC.
24 Manor House Road
Newton Centre, Mass. 02159
(617) 964-1894

DOCUMENTATION:

YOU CAN PAY NOW... ...OR PAY LATER

By Gary Rosensteel

A recent series of television commercials told viewers that spending a few dollars to replace a car's oil filter could save hundreds of dollars in major engine repairs. "An ounce of prevention is worth a pound of cure," as Benjamin Franklin said.

This philosophy can and should be applied to DP documentation. Unfortunately, it usually isn't. To most people, the task of documenting a system is like visiting the dentist. They know they should do it, but keep hoping their problem will disappear on its own.

At least this is an equal opportunity situation. Everyone is guilty. Programmers want to develop programs, not produce technical writing. Management would like to have well-documented systems but cannot justify the time expenditure when their development backlog is measured in man-centuries. Users would *love* to have good documentation — if they didn't have to pay for it.

So in thousands of DP shops, programmers and analysts are confronted daily with incomplete or (in far too many instances) nonexistent documentation. And management wonders why it takes so much time to implement application modifications. It is very difficult to modify an application's processing quickly when you have no idea where the process occurs in the system.

Further compounding the problem is the fact that many DP shops do not impose any standards on either the type or content of documentation. Although this does provide the benefit of encouraging creativity, official company documents should not be a vehicle for enhancing personal skills. Auditors traditionally (and rightly so) take a very dim view of free-form documentation.

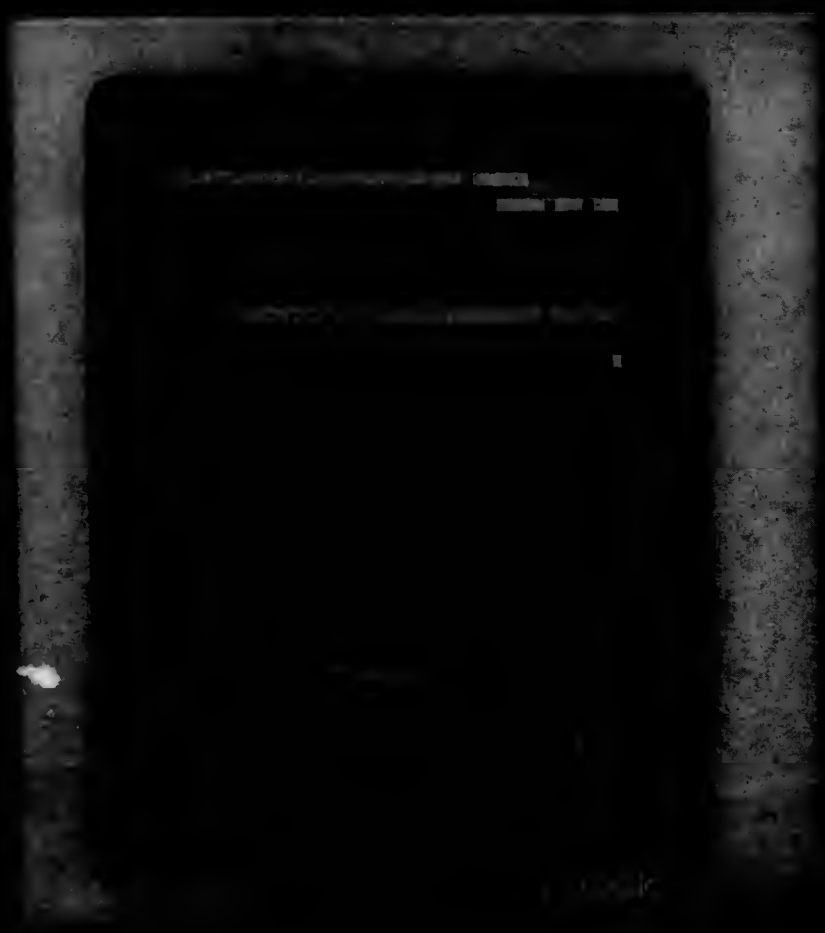
Now that we have painted such a bleak picture, is there any way out of our predicament? Yes, but it requires two things: guts and stamina.

Initially, management must have the guts to impose documentation standards and demand that people adhere to them. The staff will scream long and loud at this challenge to their "freedom." But, contrary to Sperry's recent advertisements, this is a case when you should not listen. This action is not only for the good of the company, it is also for the good of your staff. Imagine how your department would function if all applications were comprehensively documented.

Second, you need stamina because bringing existing systems up to your new documentation standard is a long, long process. In fact, this task may never be completed.

At this point, I can hear you saying, "If I'm not going to complete it, why should I even begin?" It is far better to have your most fre-

Domain



Unlimited computing power on every desktop.

Until now, there were only two ways to run your big and small jobs: on a massive batch mainframe, or on an interactive supermini.

The mainframe, while powerful, made you wait for results. The supermini was more responsive, but expensive to expand. And response time slowed every time another user was added.

Now you have an alternative that is powerful, responsive, and that grows economically—Domain Processing.

Domain Processing provides three computing essentials:

Mainframe capabilities on every desk, so you can run big programs like finite element analysis;

High resolution graphics, and the computing power to support it, to let you do interactive design applications; and

A network that lets all the users share resources—data, peripherals, and software—automatically, at disc speeds, while running their programs, big or small, at the same time without affecting one another.

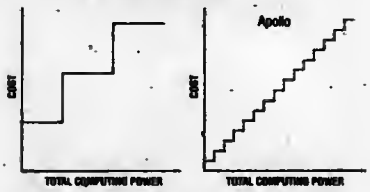
Processing Alternatives

	BATCH	TIMESHARING	DOMAIN PROCESSING
Type	Large mainframe (e.g. Cray)	32-bit supermini (e.g. VAX)	Networks of dedicated high performance computers (Only Apollo)
Typical Use	Very large computations	Interactive, real-time	Interactive and large-scale computations
Applications	Very heavy CPU-cycle applications	Multi-user, low to medium CPU cycle applications	Any number of users in heavy CPU-cycle graphics intensive applications
Typical Entry Cost	$3,000,000 to $8,000,000	$150,000–$300,000	$35,000–$50,000
Incremental processor cost	$3,000,000 to $8,000,000	$150,000–$300,000	$25,000–$50,000

TACKLES THE BIGGEST JOBS

Each user's Domain system node has a 32-bit processor, 16 Mbytes of virtual address space, and up to 3.5 Mbytes of high-speed physical memory. That means you can run very large, single-program applications such as NASTRAN, circuit design simulations, architectural/electrical construction applications and many others. Or, with Domain's inter-process communications, you can run multiple program applications. Or, you can configure an entire network for running in a distributed multiprocessing way.

Growth Costs



Domain Processing reduces your initial system cost by allowing you to install only the computing power you need. Larger systems typically force you to buy expensive and wasteful excess capacity. A Domain Processing network is expanded in cost effective, manageable increments. With a large system, expansion usually means adding another expensive processor.

ADVANCED GRAPHICS THAT WORKS THE WAY PEOPLE WORK

Domain Processing's high resolution, bit-mapped displays drive your multiple windows into different, concurrent processes—as if you were working at your desk with sheets of paper. You can move these windows anywhere, make them any size, and overlay them in whole or in part. Domain system users typically have two or three processes active, although they can display up to fifteen. You also have a choice of a vertically oriented, 15-inch display or a horizontally oriented 19-inch display, so you can work in the format that fits your application.

A NETWORK ACCESSED THROUGH NODES, EACH WITH MAINFRAME CAPABILITIES, EACH DEDICATED TO A SINGLE PERSON.

Domain system users are part of a computing community, yet they never lose what matters most—big computer performance. A CPU-intensive job that bogs down your timesharing system, or, worse, eventually increases response time so much you have to buy another supermini, runs on one Domain node. And yet a job requiring resource sharing can use all network facilities—memory, CPU power, mass storage, data and programs, peripherals—transparently, as if they are local.

Performance Per User

In most multiuser systems, response time declines as the number of users increases. In Domain Processing, each user gets a consistently high level of performance dedicated to his job.

BROAD PRODUCT RANGE

With Domain Processing, you get the peripherals, options, and software you need to handle the most demanding applications.

A performance enhancement option gives you cache memory and single and double precision floating point hardware. Disk storage, including 33 Mbyte and 66 Mbyte Winchesters and 300 Mbyte disk drives give you high-speed, on-line data storage, and a full complement of line and letter quality printers and magnetic tape systems provide storage and output capabilities.

A Multibus™ adapter and a general purpose I/O package lets you control standard and special purpose devices.

And the Domain system's comprehensive software, including ANSI FORTRAN 77, Pascal, screen editor, high level language debugger, and the system's advanced distributed virtual memory operating system is geared to support Domain Processing's multi-level interaction.

And a growing library of third party software can provide the support for your scientific, engineering, modeling, CAD/CAM, and decision support applications.

A Computer Architecture That Extends Virtual Memory Network-Wide

Today's applications demand a different approach to computing. Apollo Computer is the only company to extend demand paging across a network, so you can get information anywhere in the network as fast as you could if it were stored locally.

FIND OUT MORE AT A TECHNICAL SEMINAR

Domain Processing seminars are scheduled for Boston, New York, Washington, Philadelphia, Chicago, Detroit, Dallas, Houston, San Francisco, and Los Angeles. To find out what Domain Processing can do for you, or when the next seminar will take place in your area, fill out the coupon below or call Ed Zander, director of marketing, at (617) 256-6600.

Learn about Apollo's Domain Processing at a technical seminar presented by the system's designers.

☐ Please send me information about the next seminar in my area.

☐ Please send me more information on Domain Processing.

☐ Please have a sales representative call me.

Name _____

Title _____

Company _____

Street _____

City _____

State _____

Zip _____

Telephone _____

Apollo Computer Inc.,
19 Alpha Road,
Chelmsford,
Massachusetts
01824

apollo computer inc.

The Company That Invented Domain Processing

Multibus is a trademark of Intel Corp.

IN DEPTH

quently modified systems adequately documented, at least, than to have none at all.

Documenting existing systems is a protracted endeavor because few shops have the budget flexibility to hire extra personnel to do it. Therefore, we must "make" time available by reallocating already overburdened resources.

Admittedly, this is a difficult proposition to "buy," let alone "sell" to your users. Yet, we should follow President Reagan's advice and accept short-range sacrifices to promote long-term benefits. User concurrence may be gained by explaining that allocating 10 hours to documentation could easily save 100 hours in modification time over the life of their system. They can pay now — or pay later.

Assuming you have the intestinal fortitude and perseverance to tackle this problem, what specific documents do you need to produce? In my travels, I have discovered that there are as many types of systems documents as there are DP shops. However, all of these can be slotted within six generic types of documentation: the conceptual design, functional specification, system specification, program specification, operations manual and user manual.

Conceptual Design

The conceptual design is the first document produced when analyzing either a new system or a major modification to an existing system. This document defines the project's scope and provides the economic, operational and technical information required for management's decision on the initial feasibility of implementation.

The conceptual design addresses in general terms the system content (input, output, processing, data bases) and in specific terms the justification for implementation (problems rectified, cost savings, development and operational costs, cash-flow projection). The following paragraphs detail the types of information included in this document.

- *Description of current operation.* The "who, what, why, when and how" of the current operation. Don't forget to describe all external interfaces (input from other departments, data sent to accounting, reports for government agencies and so on).
- *Statement of problem.* What are the trouble spots in the current environment and what burdens are they placing on the operation? Is there potential for new problems to develop? If the order number is five digits and you recently entered the 90,000s, that's a very potential problem.
- *Overview of the proposed system.* In general terms, how will the proposed system function and how will it resolve the problems identified in the previous section? This portion of the conceptual design should, if applicable, include recommendations outside of automated systems (personnel reassignments, new forms, changes in the work flow and so on).
- *Operational requirements of system functions.* These include types and frequencies of input and output; a general description of data to be retained on data bases or files; and internal system controls and calculations (automatic purging of historical data, payroll calculations and so forth). How will the user interface with the system?
- *System operating environment.* Is the system on-line, batch or a hybrid? If there is on-line processing, include the type, number and location of terminals. What hardware will the system operate on? What software packages will be used in the application?
- *Excluded functions.* What functions evaluated during the initial analysis are excluded from this proposal? Have they been dropped, held for later phases of the system or set aside for independent development? Why was this action taken?
- *Benefits.* Describe in detail the cost savings to be realized and how the proposed system produces these benefits. What administrative benefits (greater data accuracy or improved information availability, for example) will the proposed system produce?
- *Costs.* How much analyst, programmer and computer time will be necessary to develop and operate the system? What costs, if any, will be generated by acquiring hardware

How to get the jobs done:

WYLBUR® 6.0 versus TSO

Over 2,000 companies use WYLBUR to speed applications development. They discovered that WYLBUR used less resources than TSO and improved the productivity of their programmers.

A new WYLBUR user is productive immediately. You can install WYLBUR in less than 30 minutes and also take advantage of an extensive library of educational materials.

Every programmer will enjoy the power of WYLBUR's easy-to-use Full-Screen Editor.

There is no better programmer productivity system available! With WYLBUR, you will dramatically improve response time.

WYLBUR has document formatting, electronic mail, word processing, and best of all – applications prototyping (unique to WYLBUR) In seconds you can create an entire application! You interactively design a sample input or output screen and combine it with simple WYLBUR commands to display the input screen...edit the input data... do calculations...even update a database...and display the output screen. ZAP! Instant application! Your users will be able to "hands-on" test their application system before you begin programming! Think how fast you will be able to respond to requests for new applications!

Dramatically improve productivity while reducing response time and resource consumption – Get WYLBUR!

OBS has the software solutions for you.

☐ I'd like to do better than TSO
Let me know all about WYLBUR

Name
Title Phone
Company
Address
City State Zip

Mail to **OBS Software**
115 Sansome Street
San Francisco CA 94104

OBS Software
Division of On-Line Business Systems, Inc.

San Francisco
115 Sansome Street
San Francisco CA 94104
(415) 391-9555

Los Angeles
New York
Atlanta

International Agents:
Westinghouse
Management Systems S.A.
Main Office Paris, France

*WYLBUR is a trademark of Stanford University

and software? What costs will the user incur to complete system implementation (relocation of facilities, new equipment, new forms and so on)?

• *Cash flow.* Cost savings vs. costs are projected from the start of development through the operational life of the system, usually in quarterly or annual increments.

Since the conceptual design is primarily a user and upper management document, it must be written in easily understandable, nontechnical terminology. Technical jargon and acronyms should be omitted. Once the conceptual design has been prepared and approved, it is filed as reference material. The next step in the development of the system is preparation of the functional specification.

Functional Specification

The functional specification details the specific functions to be delivered to the user and provides sufficient information for management to approve, fund and schedule system implementation. It does not explain the internal operations of a system (how things are done), but rather it presents an external view of the system (what functions the system performs). As with the conceptual design, this document must be written in easily understandable, nontechnical terms.

Since the functional specification is written primarily for the user, it should be structured so the user can access information quickly on specific functions (how paychecks are calculated and generated, how customers are established and maintained on the accounts receivable data base). There is a tendency to create the functional specification in a system-structured mode, grouping by type of activity (all input transactions, all weekly batch reports and so forth). However, this makes it very difficult for the user to follow and should be avoided.

When compiling the functional specification, the writer should begin with the first three sections of the conceptual design (description of current operation, statement of problem and overview of the proposed system). In describing the remainder of the functional specification, we will assume that an on-line system is being presented.

In the next portion of the document, the following types of information should be included:

• *General assumptions.* Some examples of entries in this section are: (a) No single order will exceed $10 million; (b) All data will be input by 10 a.m.; (c) The (user) department is responsible for ensuring compliance with government regulations. This section provides insurance against future misunderstandings.

• *Glossary.* If any acronyms or terms not universally understood are used in functional specification, they should be defined in this section.

• *Responsibilities.* What are the specific responsibilities of the DP department and each user area concerning the system's operation? Who

IN DEPTH

enters what data? Who verifies data accuracy? Is DP or the user responsible for terminal maintenance?

• *System security.* Fully describe all levels of security provided in the system: 1. physical (Are terminals placed in secured areas? Do terminals have key, card or cipher locks? How is blank check stock controlled?); 2. network (What transactions are allowed to which users? Are passwords used?); 3. application (Is access to specific data restricted to certain users?).

• *Terminals and communications network.* Describe the types of terminals (CRTs, line printers, RJE) used in the system and their general functions. Use an illustration or table to show the network configuration (which terminals are on which lines). This information is necessary to determine backup terminals in case of line failure.

• *Data retention.* How long will data be retained in the on-line system? How is data purged (automatically or under user control)? What data will be stored off-line and what is its retention cycle? What data will be stored off-site and when will it be stored (weekly, monthly)?

• *Audit controls.* Describe all balancing techniques and controls used in the system's operation (both automated and manual). Describe data audit trails. From an audit and legal viewpoint, this is one of the most important parts of a system's documentation.

• *Tables.* If the application makes extensive use of external (to the program) tables, they should be detailed in this section. Describe what the tables are, their contents, where they are used and how the user will update them.

The next portion of the functional specification details how the user will perform his responsibilities (how to update the customer data base, how to enter orders and so forth). Within each area, examples (using valid data) must be shown of all transactions and/or reports the user will work with or reference. In addition, diagrams should be included depicting the external work flow and interdependencies of all system functions.

The final entry in the functional specification should be descriptions and layouts of all transactions and reports in the system. This section should be cross-referenced to the descriptions of user functions.

If system implementation involves data conversion, an appendix should be added to the functional specifications. This appendix describes what data is being converted, how it will be converted and how data accuracy will be verified. This information is included as an appendix, as it is not an ongoing function. Nevertheless, it is critically important to a successful implementation.

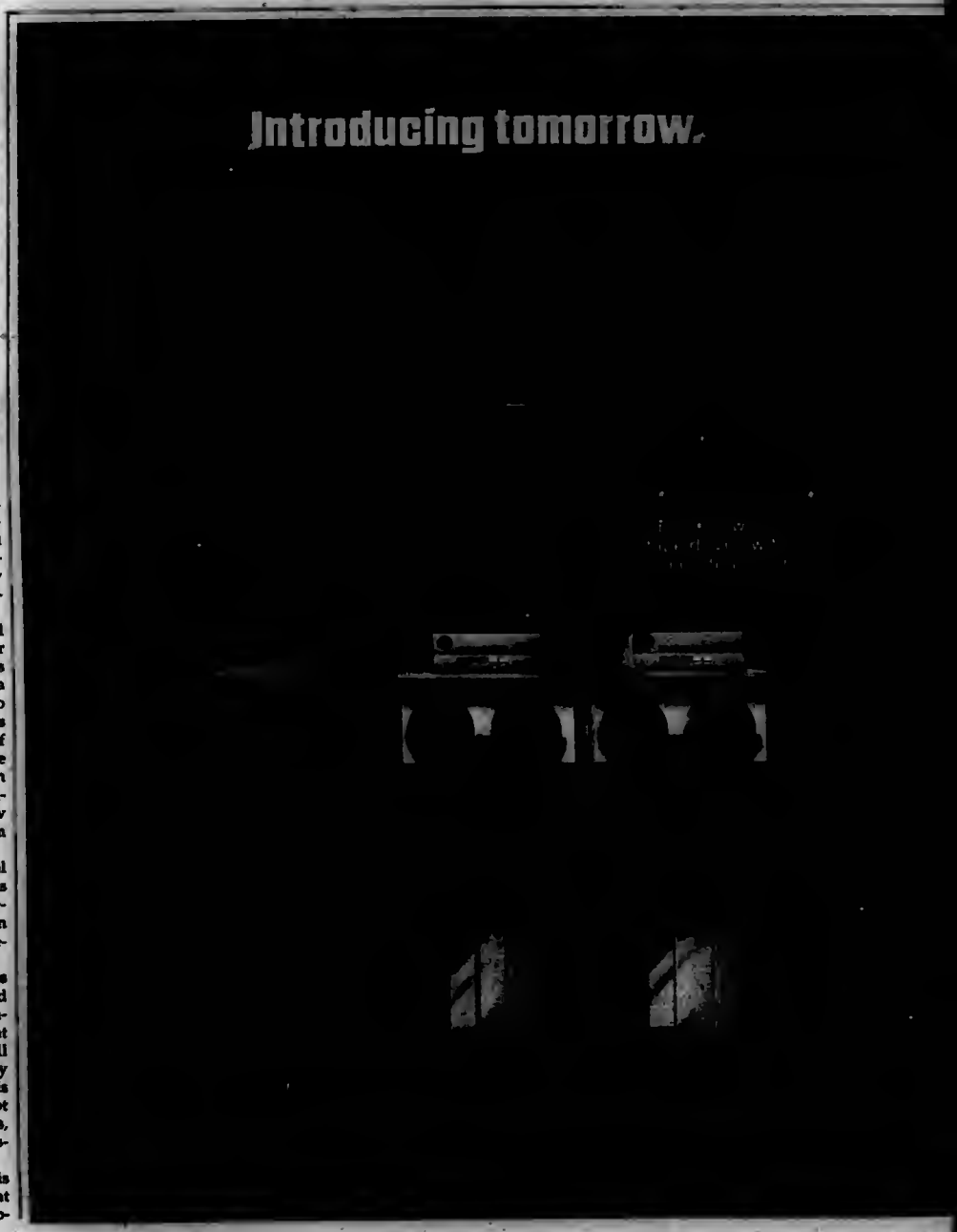
Once the functional specification is complete, DP and user management conduct a second review of the proposed application. The purpose of this review is to arrive at a final decision on implementing the system. It will be necessary to rework the cost/benefit analysis at this point, as additional data is available and more accurate projections can be produced. Assuming approval to proceed, the next document produced is the system specification.

System Specification

The system specification is the primary technical document of an application in that it is written for the DP department, is the source document for preparation of program specifications and the operations manual and will be the prime reference when evaluating future system modifications. In spite of its important role, the system specification is one of the easiest documents to prepare, because a major portion of its content is lifted directly from the functional specification.

The only two portions of the functional specification not included in the system specification are the description of how the user performs the various system functions and the conversion appendix, if present. The remainder of the system specification should include the following sections:

• *System flowchart.* This section depicts how individual programs and processes are related and the flow of data through the application. The



flowchart should include all job steps, program names, a brief description of program activity, files used or created in each program, sort sequences and data flows.

• *Data dictionary or data element definition.* If your installation has a data dictionary software package, it may be utilized to prepare this section. If not, this section should still be present, but it will have to be prepared manually.

• *Data base/file layouts.* Sort and work files should be excluded from this section, but all other data bases and/or files should be present. If data bases are used, hierarchies or relationships should be displayed.

• *Job/run descriptions.* Every job/run in the system must be described in both narrative and flowchart form. This description details the function(s) performed, a general overview of the internal processing, input and output, interdependencies with other portions of the system and frequency of operation.

• *Program descriptions.* Each program in the system should be described in narrative form. This description should reference all input, output, sort and work files used in the program. Internal processing should be defined at a level midway between a general overview and a totally detailed description. The programs must be cross-referenced to their appropriate place in the job/run descriptions section.

Introducing tomorrow.

Telex 8020-2X Tape Sub-
adds up to significant savings
and leasing costs.

DOLLAR SAVINGS

CONFIGURATION	1x4	1x8
POWER	$ 3,002	$ 5,090
AIR CONDITIONING	$ 3,366	$ 5,622
LEASE	$21,224	$36,600
TOTAL	$27,592	$49,312

• *Production schedule.* This section details the day (Monday, third day of month or whatever) each job must be run, and the time (before 9 a.m., after 6 p.m.), if necessary. All jobs in the system must be listed and grouped by run frequency (daily, weekly). "As-requested" and on-line jobs should be listed last. On-line system availability should also be delineated (system will be operational Monday through Friday from 7 a.m. to 6 p.m.; system must be operational seven days a week for all hours except 2 a.m. to 3:30 a.m.).

• Change log. This section is activated after the system has become productional to record *all* modifications. The log should show why the change was required, who was responsible for its implementation and what was changed (programs, data bases, reports). Specific details of each change should be recorded in the applicable program specifications. However, the change log should provide sufficient information for the reader to gain a general understanding of the modification.

The next task in the documentation process is usually started as the system specification is being finalized. This step is preparation of the program specifications.

Program Specifications

Each program in the system should have an associated program specification document describing all aspects of the program to a detail level. If the program specifications are correctly prepared, a programmer with no prior knowledge of the system should be able to ascertain quickly how and where to make changes.

Although the program specifications are started prior to the beginning of programming, they usually are not completed until the programs have gone through testing. If the system specification has been correctly prepared, the program specification can be completed with little difficulty, though, because much of the necessary data is contained in the former document. The following sections of the program specifications can be derived from the system specification:

• Narrative description.
• Operational flowchart.
• Data base/file layouts.
• Report descriptions and layouts.
• Transaction descriptions and screen layouts.
• Tables.

The sections that must be developed are:

• Structure chart or logic flowchart.
• Operations information.
• Description of error messages.

Each program specification must also contain a change log section. It is similar to the system specification change log except that all changes must be completely detailed.

Operations Manual

If no other systems documents exist, there is almost always an opera-

IN DEPTH

tions manual; operations personnel will usually not allow a system to "go into production" without documented procedures. If this requirement were enforced for all documentation, the DP shops of the world would be in much better shape.

Operations manuals are the least generic of the system's documenta in that the format and content vary depending on the organizational structure of the operations department, installed hardware, systems software and the nature of the application (on-line, batch). However, some of the items that should be considered for inclusion are:

- A narrative description of each job.
- Setup instructions.
- Restart/recovery procedures.
- Output distribution.

This list is certainly not all-inclusive. You will probably need to provide other data to satisfy the requirementa of your location.

User Manual

Have you ever seen a good user manual? I haven't. If a user manual exists for a system, it can typically be slotted within the range of very poor to barely adequate. DP skirts this problem through the all-purpose statement, "It's the user's responsibility."

Don't blow that smoke my way, though, because I can see through it. DP's job does not end at productional cutover. The DP department has a professional responsibility to ensure the user knows how to operate the system. Could you assemble a 10-speed bicycle using only a photograph of a completed bike? Would you buy a personal computer without an instruction manual?

Even if your organization has defined preparation of the user manual as a user task, the DP department has the responsibility to assist in its preparation and ensure the document is correct. Look at it this way: If the user is having difficulty operating the system, who do you think will get the blame — an inadequate user manual or the DP department?

When preparing the user manual, keep in mind that it will be used both as a training and reference document. Also, it must be written so that everyone who interfaces with the system (from junior clerk to upper management) can easily understand his portion of the operation.

The Golden Rule of preparing this document is, "Don't leave the user hanging." Every user function must be defined. The user must be appraised of the appropriate response to all possible error conditions.

The format and content of the user manual is a decision between you and the user. However, I recommend using the functional specification as a starting point.

Controlling Documentation

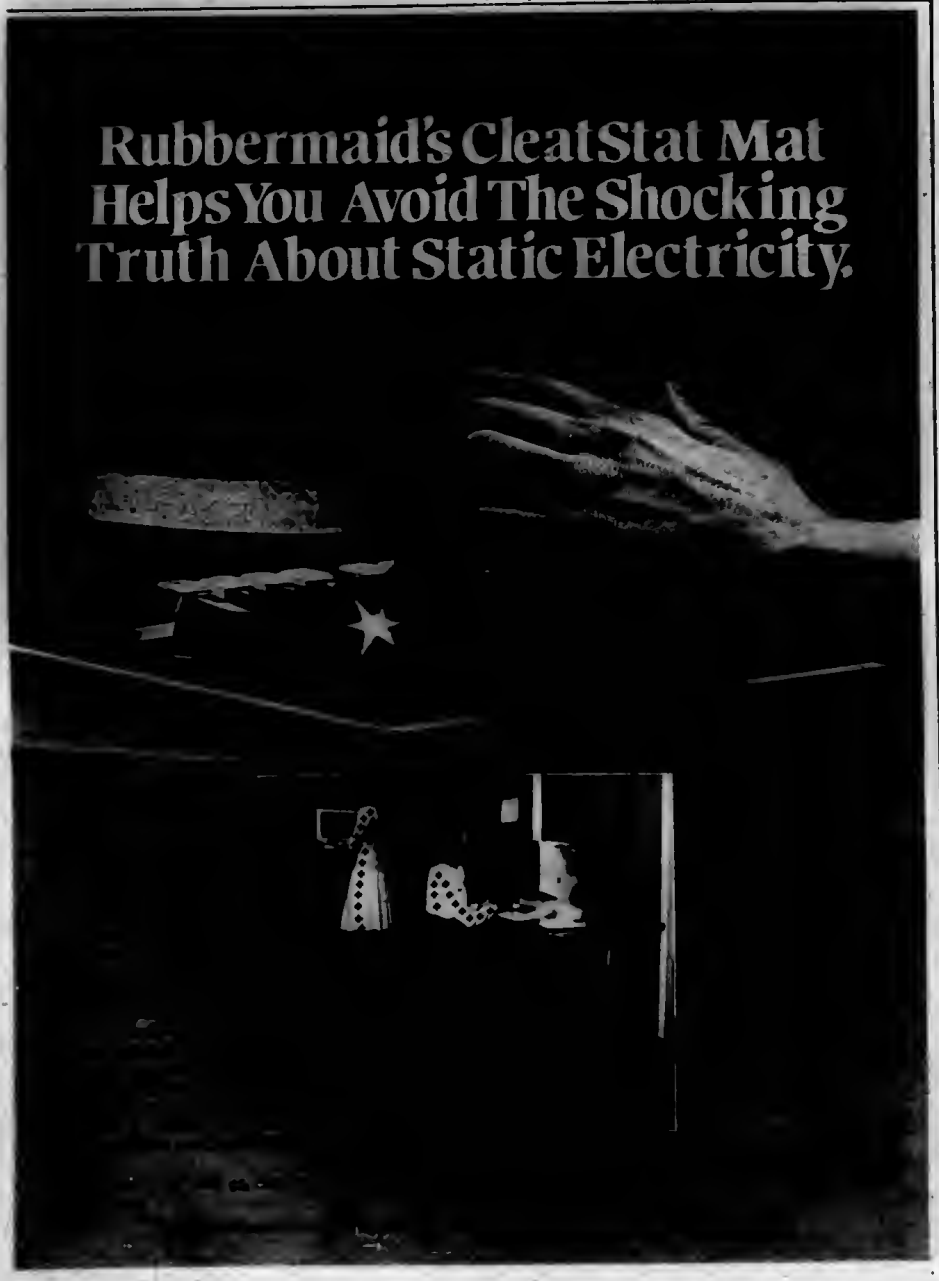
Once you have generated all this documentation, the next question is, "What do we do with it?" Well, it will be necessary to establish a documentation library. This is not to say that a separate facility must be established. The documentation library can be placed in any area with sufficient security so access can be controlled by a documentation librarian.

Whoa! I've upped the ante again. Not only do you have to allocate space to a library, now I'm calling for a librarian. Before you reject this proposition as too expensive, let's examine the requirements.

The documentation library can consist of lockable cabinets, and the librarian's responsibilities can be assumed by an operations clerk or a secretary. However, if your programming staff is larger than 20 individuals, you should consider making this a full-time position. If you have more than 40 programmers, you probably will need a full-time librarian.

As a general rule, you should assign one-half a person to the documentation library for every 25 programmers on your staff. In any case, one individual will be assigned responsibility for the library as documentation librarian, while any others assigned to the library will report to the librarian as documentation clerks. The responsibilities of the librarian are as follows:

- *Maintenance of the library.* This does not mean preparing documentation modifications. The librarian is responsible for maintaining secure



storage, filing materials properly and placing updates in their correct place in the documentation.

• *Ensuring adherence to standards.* In this capacity, the librarian serves as your documentation "policeman." The librarian reviews all documentation for adherence to your standards. Further, the librarian must have the authority to reject documentation not meeting these standards. The way to enforce this requirement is not to allow a new system or modification to become "productional" until the documentation has been accepted. Yes, this will cause problems initially, but don't give in. Once your staff realizes you mean business, they will adapt.

• *Controlling access.* The documentation library is *not* public. Access to any documentation should require written approval of DP management, and the librarian must log all documenta in and out of the library. A time limit should be established for "loan" of the documents, after which they must be returned to the library. A documentation library quickly loses ita effectiveness if the documents are spread ali over the programming department.

• *Ensuring adequate backup.* Most DP shops have been storing critical data off site, for years; however, how many have off-site storage of documentation? How difficult would it be to resume operations if all your documentation was destroyed? The librarian is responsible for keeping a current version of all documentation in secure, off-site storage. This off-site documentation may be on microfiche; however, it must be as up-to-date as possible.

What documents should be stored in the library? I believe all documentation should be kept on file. However, the conceptual design and functional specification will not be updated and should be stored as reference material. The system specification, program specifications and operations manual must be controlled to ensure they are continually updated to reflect the current state of the application. The library exista primarily for these documents. I also feel the user manual should be controlled, but I leave this to your discretion.

The documentation library described may appear to be a theoretical ideal, but I have personally seen (and was very impressed by) just such a library.

While working as a DP auditor for one of the largest corporations in America, I was assigned to perform an audit on one of the company's computing centers. The audit did uncover some major operational problems; however, documentation was not one of them. In fact, the documentation was so good, I felt the center's policies and procedures should be adopted as a corporate standard.

The thing that distinguished this library from others was control. The installation had rigid documentation standards that were universally applied and enforced. Any documentation that did not meet these

WHAT THE ASSEMBLY LINE DID FOR MANUFACTURING, INFORMATICS SOFTWARE WILL DO FOR ON-LINE PROCESSING.

INTRODUCING MARK V, YOUR IMS EXPERT.

Informatics Inc /21050 Vanowen Street
Canoga Park, CA 91304 (213) 887-9121
☐ Send me complete details on MARK V.
☐ Have a sales representative call me
Name
Company
Address
City State Zip
Telephone
Computer Operating System
CW 41302
informatics inc
Your Information Management Partner

IN DEPTH

standards completely was rejected. And the new system or modification could not go into production until the documentation had been approved by the documentation library.

As a professional, I felt I had died and gone to data processing heaven. Never before or since have I seen such a comprehensive documentation library. Imagine the joy of having ready reference to any aspect of all systems in your shop!

Planning Implementation

Now that we have discussed the types, format, content and control of documentation, the final step is to plan implementation of the program. The activities to be accomplished (listed in order of occurrence) are as follows:

• *Prepare standards.* There must be official, published standards covering all aspects of the documentation program: What documents are necessary at which stages of development? Who prepares, reviews and approves the documents? What is the required format and content of each document?

• *Assign library responsibility.* Whether an existing staff member or new hire, someone must be specifically assigned responsibility for the documentation library. In addition, this operation must be delegated a "safe" spot in your organization. Having the documentation librarian report to the programming manager is an unwise decision.

• *Set up facility.* This entails allocating space, requisitioning equipment and physically setting up the library.

• *Gather documentation.* To avoid a scavenger hunt, the head of DP should send a memo to the entire staff. Why everyone? You will be surprised (and possibly appalled) when you discover where your documentation is currently "stored." The memo should be a directive: "All documentation must be turned in to the documentation library by (insert date)."

• *Evaluate status.* To accomplish this task, first you will have to create a checklist of documentation requirements. Next, the checklist must be applied to all systems and programs under your control to determine their current documentation status. This evaluation will quickly flag critical deficiencies (for example, undocumented payroll programs).

• *Correctly document a pilot system.* Choose a representative productional system and assign personnel to prepare whatever is needed to bring the documentation up to your new standards. This accomplishes two purposes. First, it establishes a reference example for other documentation, and second, it will help convince your staff that new documentation requirements are "for real."

• *Institute new requirements.* Officially inform the DP staff and user management that the new documentation standards, policies and procedures are in effect and will be enforced. Make sure you emphasize and carry through on the latter.

• *Establish a retroactive documentation program.* Using the previously developed checklist, establish a plan for cor-

Immediate, reliable hard copy data communications with a sustained 150 cps rate. Whether you're linking several departments within the same facility . . . several buildings within the same city . . . or interconnecting print stations in cities around the world, GE 2120 printers are ideal in electronic mail or other communication network applications.

Stylish, compact, lightweight, quiet and easy-to-use, the energy efficient GE 2120 comes with an outstanding list of standard features. And if you need more, we have more than enough options to choose from.

GE IS YOUR BEST CHOICE FOR QUALITY OPTIONS.

A 32K Text Editor allows you to work off-line to reduce on-line time and communication charges as much as 70%. Transmission speeds are available from 110 to 9600 baud. A range of data buffers from 2K to 16K capacity provide the throughput efficiencies you need at high transmission speeds.

Internal FCC-registered auto-answer modems save work space and external dataset cost. All you need is a standard modular phone jack. You get choices in paper handling: friction, pinfeed platens, or adjustable tractors. And a range of other useful options and accessories is available to meet your specific needs.

YOU'LL FIND WE HAVE MORE THAN ONE MODEL OF EXCELLENCE.

General Electric also offers the GE 2030 printer. Identical to the GE 2120 in standard features and available options, the GE 2030 prints at sustained speeds up to 60 cps. Of course, there is one other difference . . . it also costs less. So if you don't need the speed, selecting the GE 2030 may be your best choice.

MATCH THE PRINTER TO THE PROBLEM.

The GE 2000 printer family allows you to meet your communication network, time-sharing, order entry, CRT hard copy and process control needs precisely. Efficiently. Effectively.

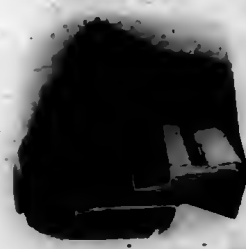
WHO'S FIRST IN ELECTRONIC PRINTING?

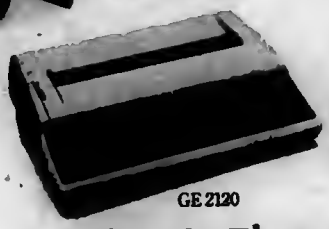
Today, General Electric is a specialized full-line printer supplier with over a decade of expertise meeting a wide range of data printing needs.

And remember, our roots go back to Thomas Edison. It was in his tradition that in 1969 we introduced the first electronic printer with modern LSI circuitry. Since then, we've continued to advance the quality and reliability of printer technology.

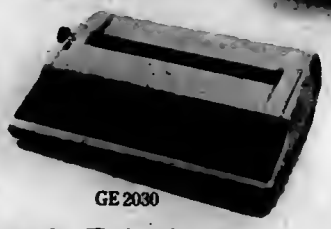
General Electric . . . the industry leader in electronic printing. We pioneered the industry in the first place.

With GE 2120 printers in your network, word gets around fast.





GE 2120



GE 2030

First In Electronic Printing.

For the solution to your printing needs, call TOLL FREE 800/368-3182.
General Electric Company, Data Communication Products Department, Waynesboro, VA 22980. In Virginia, call 703/949-1170.

Or call the authorized General Electric Distributor Headquarters nearest you: Benchmark Computer Systems, Bloomington, MN, 612-884-1500 • Carterfone Communications Corp., Addison, TX, 214-387-8732 • Continental Resources, Inc., Bedford, MA, 617-275-0850 • Data Access Systems, Inc., Blackwood, NJ, 609-228-0700 • Data Rentals/Sales, Inc., Culver City, CA, 213-559-3822 • Data Systems Marketing, San Diego, CA, 714-560-9222 • Data-Tron, Inc., Wickliffe, OH, 216-585-8421 • David Jamison Carlyle Corp., Los Angeles, CA, 213-277-4582 • Digital Associates Corp., Stamford, CT, 203-327-9210 • FICOM®, Inc., Horsham, PA, 215-441-8600 • National Computer Communications Corp., Stamford, CT, 203-357-0004 • Qytel/Consolidated Data Systems, Ltd., Bogota, NJ, 201-487-7737 • RCA Service Co./Data Services, Cherry Hill, NJ, 609-338-5242 • Schweber Electronics, Westbury, NY, 516-334-7474 • Tel-Tex, Inc., Houston, TX, 713-868-6000 • Transnet Corp., Union, NJ, 201-688-7800 • U.S. Robotics, Inc., Chicago, IL, 312-346-5650 • W.A. Brown Instruments, Inc., Orlando, FL, 305-425-5505 • Authorized agent: ICESO Headquarters, Schenectady, NY, 800-528-6050, Ext. 1715 except in Arizona, 800-352-0458, Ext. 1715.

GENERAL ELECTRIC

rectly documenting all your existing systems. As mentioned earlier, you should begin with those systems that are most frequently modified. This will provide high visibility to the program and should quickly produce measurable benefits (faster turnaround on modifications).

Since all DP installations are overburdened, it will be difficult to complete this task rapidly. However, you should allocate a fixed percentage (say 5%) of your staff time to this endeavor and insist that the staff regularly devote this time to documentation.

• *Monitor progress.* This is a twofold task. First, you must stay on top of activity in the documentation library to ensure the staff isn't dragging its feet on implementing the new procedures. If problems are developing, send out memos and hold staff meetings to exhibit your determination. There will always be some people who require the "two-by-four" method of communication.

The second part of this task is: (a) preparing schedules for upgrading the documentation of existing systems and (b) monitoring progress against the schedules. There should be a master schedule with estimated completion dates for all systems. Then as work is begun on a system, a detail schedule should be created for completing individual documentation items.

Data from the pilot system project can be used to generate initial estimates, but keep in mind that time requirements should diminish as your staff gains familiarity with the process.

Summary

What I have presented are guidelines for establishing good documentation procedures. As such, they will have to be modified to fit your environment, if you choose to follow them. Whatever your decision, one option not open is to do nothing.

Adequate documentation of business applications is a legal requirement of the federal government. If you don't believe me, just ask your friendly DP auditor about the Foreign Corrupt Practices Act. Although this may not appear to have any relevance to documentation, it does — in a big way. You will be surprised to discover yoor installation may be in violation of the law. Not that DPers are being hauled in and sent up the river; however, this is an issue that cannot be overlooked.

In spite of the legal considerations, the main reason to upgrade your documentation is to improve the productivity of your department. This may seem to be double talk. After all, how can a department improve its productivity by taking on new responsibilities? Well, initially productivity will not improve. In fact, it may be diminished, but this is a short-range sacrifice that must be endured.

The long-term benefit will be significantly increased productivity resulting from such factors as ease of application maintenance, greater understanding of system processes by both DP and the user, ease of assimilating new hires and ability to change personnel assignments (moving programmers and analysts onto other applications to broaden their experience).

Granted, upgrading documentation will impose a strain on the DP budget. However, documentation is not a discretionary luxury; it is a vitally important investment. If properly managed, it will produce a very high yield.

Spending $5,000 on documentation could easily save $50,000 in maintenance over the life of a system. But the choice is yours. You can pay now — or pay later.

About the Author

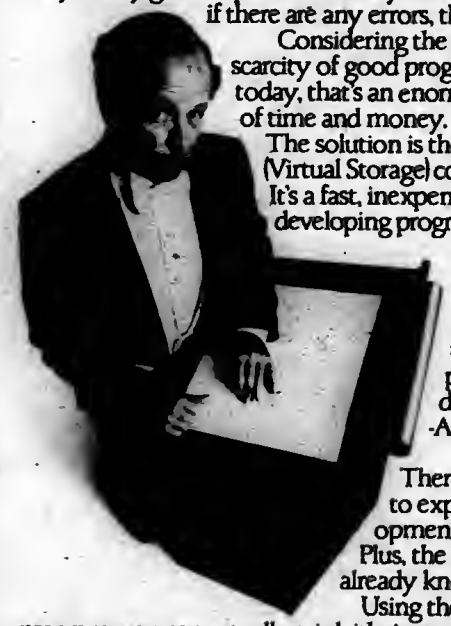
Gary R. Rosensteel has been involved in private industry, government and educational DP environments for 19 years.

Having held such positions as programmer, systems analyst, project leader, DP auditor, DP trainer, manager of systems development and independent consultant, Rosensteel has participated in all phases of the application development process.

He holds a B.S. from Valparaiso University and an MBA from the University of Pittsburgh and has conducted public seminars on systems analysis.

Do your programmers need a reservation to use the computer?

If you're using a mainframe computer, you know the problems your programmers face. Too often, they have to wait in line to get to the computer. When they finally get computer time, they're not even sure if their program will work. And if there are any errors, they have to go back to the end of the line.



Considering the price and scarcity of good programmers today, that's an enormous waste of time and money.

Wang VS Computer.

The solution is the Wang VS (Virtual Storage) computer. It's a fast, inexpensive system for developing programs for use on your mainframe computer.

Triple your programmer's productivity.

The Wang VS is interactive, so programmers can work from their own terminals directly on-line with the computer. Programmers write, compile, and debug programs from their workstations. And find out about any errors instantly.

And it's remarkably easy to use. There are special program development utilities to expedite program design, source code development, and program debugging processes. Plus, the VS uses high level languages your people already know, like COBOL, RPG II, and BASIC.

Using the Wang VS, programmers can actually triple their productivity. Which can save your company a lot of money, and speed up program development time. What's more, the VS can also be used to simultaneously off-load selected programs from your mainframe. You can even get Wang Mailway™ electronic mail and message system and Wang word processing—#1 in the world.

So find out more about how Wang can help your programmers become more productive. It's one decision you won't have any reservations about.

For a demonstration of the Wang VS computer, call

1-800-225-0643

(in Massachusetts call 1-617-459-5000, extension 5711) Or send this coupon to: Wang Laboratories, Inc., Business Executive Center, One Industrial Ave., Lowell, MA 01851

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone ( ) _____

A290

WANG

The Office Automation Computer Company

© 1981 Wang Laboratories, Inc.

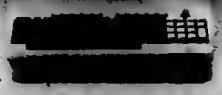
SAY UNCLE.

$595.

ADM 3A DUMB TERMINAL®

- The original Dumb Terminal
- Full or Half Duplex up to 19.2K Baud
- 1920 Characters in 24 rows of Characters
- RS232C Gated Extension Port
- Direct Cursor Addressing
- Over 200,000 in use

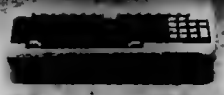
$645.



ADM 5 ENHANCED DUMB TERMINAL®

- All ADM 3A Features Plus
- Reverse Video, Reduced Intensity or Combination of Both
- Limited Editing with Erase to End of Line/Page
- Gated Extension Port
- Integral Numeric Keypad
- Individual Cursor Control Keys*

$695.



ADM 21 SMART TERMINAL

- Conversation, Block Mode Operation
- 8 Shiftable Function Keys
- Full Editing/Visual Attributes
- Printer Port
- Transmission Control
- International Character Sets Available
- Popular Terminal Emulations Offered

$1095.

ADM 31 SMART TERMINAL

- Two-Page Display Memory
- Buffered Printer Port
- Full Editing/Visual Attributes/Business Graphics
- Polling
- Dynamically Modifiable Personality
- Optional 25th Line/Smooth Scroll/X-ON, X-OFF/ Programmable Function Keys

$1195.

ADM 36 DEC SYSTEM TERMINAL

- ANSI Standard
- 80 or 132 Column Display
- Jump or Smooth Scroll/Split Screen
- Non-Volatile Set-Up Mode Using "English" Prompts
- Non-Embedded Visual Attributes
- Selectable International Character Sets
- Shown with Optional 15" Monitor

$1295.

ADM 32 OEM EXPANDABLE SMART TERMINAL

- Optional Integral 300/1200 Baud Modem with Auto Answer, Auto Dial, Keyboard Programmable
- Optional Polling
- 2 Pages of Memory/25th Line
- Full Editing/Visual Attributes/Business Graphics
- Programmable Function Keys
- Jump or Smooth Scroll

Until now there's been quite a war going on over prices and features in the terminal industry. Until now, that is—the competition just lost, hands down.

For years, Lear Siegler has set the standards of the industry. Dumb and smart. And the competition has worked hard to imitate them.

But these new prices and performance features are the toughest standards anywhere. Bar none. So it's back to the drawing boards for everyone else in the industry.

Meanwhile, Lear Siegler is featuring a complete family of low priced, high performance terminals with attached or detachable selectric keyboards, white or green screens, Dumb or smart.

The detachables offer extra memory and accept an extra board for speech, graphics, modems, controllers or additional memory. Options include 15" screens and a convenient tilt mechanism.

So if you've been holding out, waiting for the right prices and features, give in.

Say uncle. Say Lear Siegler.

LEAR SIEGLER, INC. DATA PRODUCTS DIVISION

INCREDIBLE PERFORMANCE, INCREDIBLE PRICES.

Lear Siegler, Inc., Data Products Division, 714 North Brookhurst Street, Anaheim, CA 92803. Attn: Adv. **Regional Sales Offices:** San Francisco 415/828-6941 • Los Angeles 213/454-9941 Chicago 312/279-5250 • Houston 713/780-2585 • Philadelphia 215/245-1520 • England (04867) 80666 *From the states of CT, DE, MA, MD, NJ, NY, RI, VA and WV, call (800) 523-5253.

Dumb Terminal is a registered trademark of Lear Siegler, Inc. Quantity One U.S. Prices

Intellimac Commercial Ada Package

ROCKVILLE, Md. — Intellimac, Inc. has announced what it said is the first commercially available applications program written entirely in Telesoft, Inc.'s Ada compiler software. Although the object code is available separately, the complete payroll hardware and software package is available from the six-year-old firm only on a turnkey basis.

The payroll program was designed to handle up to 32,000 employees, depending on the disk storage available. The number-crunching routines reportedly are supported by Intellimac's 64-bit floating-point routines, which are written in assembly language, but configured to look like an Ada package and therefore can be callable by any Ada program.

Intellimac also developed a series of utility packages that encompass string handling, numerical calculations, I/O routines, format checks, screen generators and assembly language interfaces, the vendor explained.

The company has integrated its own hardware, using the Motorola Corp. 68000 CPU on both Digital Equipment Corp.'s Q-bus and Intel Corp.'s Multibus. The hardware version for the Q-bus is priced at approximately $17,000, including 10M bytes of disk storage. The Multibus version, including between 32M bytes and 169M bytes of Winchester disk storage, is priced between $20,000 and $45,000.

Object code for the payroll software alone is available for $3,500. The complete package utility software, in object code, is available for $2,000.

Intellimac is located on the Sixth Floor, 6001 Montrose Road, Rockville, Md. 20852.

Replace Applicon Series 800

Modular CAD/CAM Systems Debut

BURLINGTON, Mass. — Applicon, Inc., a Schlumberger company, has unveiled a series of modular 16- and 32-bit computer-aided design and manufacturing (CAD/CAM) systems that reportedly feature high-performance processors, ergonomically designed workstations and resolution-enhancing screen logic.

The Series 4000 systems family replaces the firm's previous Series 800 Applicon Graphics System machines.

With the new systems, the firm also introduced a number of software products, including a graphics networking product, a data base management system (DBMS) and an advanced graphics language that is said to provide users with expanded programming capabilities.

The Series 4000 basically consists of three turnkey systems: the entry-level 4225, the 4245 and the high-end 4275. The 4225 and 4245 are based on Digital Equipment Corp. 16-bit PDP-11/34 minicomputers and include the RSX-11M operating system. The 4275 incorporates DEC's 32-bit VAX-11/751 processor and VMS operating system and virtual memory architecture. The latter system represents Applicon's first use of a superminicomputer in its CAD/CAM systems design.

All of the systems incorporate an Applicon-designed 32-bit graphics processor — the Graphics 32.

At the core of Applicon's Series 4000 are two new workstations and three new graphics processing facilities, the 4225, 4245 and 4275.

Complete Graphics Workstation

The 4225 satellite graphics processor (SGP) was designed to be used, along with the firm's just-debuted networking software, in a distributed graphics network. However, the system is a complete graphics workstation and can reportedly be used as a stand-alone design system for small printed-circuit board design companies. Most notably, prices for the system start at less than $100,000 — a new pricing low for Applicon.

The 4225 is configured with 216K bytes of main memory, an 80M-byte disk subsystem and the 32-bit graphics processor. It can support up to four workstations — color or black-and-white — and four disk drives.

The 4245 graphics processing facility (GPF) is also a 16-bit-based system and like the 4225 can handle up to four workstations and includes 216K bytes of memory and the Graphics 32 processor. However, the 4245 can accommodate up to four dual-density tape drives and four disk drives. Disks can be mixed and matched for up to 1.2G bytes of on-line storage, the spokesman said.

Finally, the 4275 GPF features 32-bit processing capabilities, which increase processing power and design speed, and 1M byte of main memory that can be expanded to 2M bytes. Like the previous system, the 4245 has a total of 1.2G bytes of on-line disk storage. However, the high-end machine can operate as an interactive processor, handling up to 12 workstations, the spokesman explained.

(Continued on Page 60)

TERMINALS TERMINALS TERMINALS
RENT - SELL - LEASE/PURCHASE - RENT - SELL - LEASE/PURCHASE
Since 1966
Immediate Delivery
• TEXAS INSTRUMENTS
• GENERAL ELECTRIC
• HEWLETT PACKARD
Many other brands. Modems & Couplers too

Clearance Sale

TI 940 CRT	$1,295.00
Hewlett Packard 2621A	$1,395.00
DEC LA 34 (Used)	$ 650.00
DEC LA 35 (Used)	$ 495.00
SOROC 120 (Used)	$ 395.00
IBM 129 Keypunch	$1,495.00
IBM C22 Keypunch	$ 995.00

DATA RENTALS/SALES, Inc.
Corporate Office: 8611 Hayden Place, Culver City, California 90230
Los Angeles (213) 559-3822 Outside California (800) 421-4505 N.Y./N.J. (800) 345-8026 Charlotte (704) 523-6685
San Francisco (415) 697-4911 Outside Florida (800) 237-9663 D.C./Baltimore (301) 982-5858 Philadelphia (215) 532-7440
Tampa (813) 934-0829

Magnetic Tape Subsystem Fits IBM Mainframes

TULSA, Okla. — Telex Computer Products, Inc. recently introduced a magnetic tape drive subsystem for IBM 360, 370 and 4300 series computers that features a multi-density operation and is said to be about 50% smaller than the competing IBM tape drive.

The 8020-2X is plug-compatible with IBM 3803/3420 tape subsystems and can run at 800-, 1,600- and 6,250 bit/in. densities. Tape speeds up to 126 in./sec are available, a spokesman said.

The Telex tape system features an integrated controller rather than a free-standing floor controller that can handle up to four tape drives. Since the integrated controller measures about 22-in. wide, compared to 30-in. wide each for the IBM 3803 and 3420 tape drive controllers, users can place four Telex tape drives in the space of two IBM 3420 tape drives and controller, the spokesman claimed.

Basic Configuration

The basic 8020-2X configuration consists of a single cabinet housing two tape drives and the integrated controller. Options under development include an attachment that will allow connection of up to four additional tape drives and a two-channel switch that will let users attach the 8020-2X controller to two separate channels on one CPU or on separate CPUs.

The tape subsystem is priced at $57,600 for two 6,250 bit/in. tape drives and the integrated controller. Additional 6,250 bit/in. tape drives are priced at $18,900 each. Lease options are also available. Deliveries of the 8020-2X are scheduled for this quarter from Telex, 6422 E. 41st St., Tulsa, Okla. 74135.

THE LAST THING WE'LL SELL YOU IS A TERMINAL.

There are hundreds of CRT terminals on the market. Some good. Some not so good. And you can buy most of them, right off the shelf. So why do more large-volume users specify Zentec? It's simple really. We provide intelligent solutions to your information processing needs. It's our business. And our solutions don't begin with a terminal. They end with one.

The Total Solution—a Custom Approach
The solution begins with you, with your system and business objectives. We work with you to help analyze and set your objectives from the viewpoints of marketing, engineering, manufacturing and your customer. Then our hardware and software team applies your solution requirements against our modular systems. We implement a unique terminal workstation around a flexible minicomputer-like bus architecture and threshold LSI technologies. In short, Zentec provides a custom solution...custom keyboards, custom printed circuit boards, custom software, firmware and even packaging... whatever it takes to solve your problem. All at a very competitive price.

Lower Cost of Ownership—the Intelligent Investment
Quality is a fundamental part of every Zentec terminal system. Since the last decade, we've met and surpassed the quality requirements of the nation's leading large-volume users. Our manufacturing processes assure the highest product quality and reliability standards. Each component, subsystem and system is 100% tested. Burned in. Then tested again. As a result, our DOA (Dead-On-Arrival) rate is less than 1%. This means you can eliminate testing our terminals prior to shipment to your customer. And our MTBF (mean time between failure) is over 10,000 hours. That translates to fewer service calls. But even if a call is necessary, our MTTR (mean time to repair) is now under 20 minutes. Work the entire equation: *competitive price + low DOA + long MTBF and short MTTR = low cost of ownership.*

Custom Solutions—Added Value
The fundamental values of a custom terminal can add up to your most intelligent alternative, specifically:
- Code executed at the terminal workstation level reduces host overhead, extending the life of the host system.
- More terminal workstations can be supported by the host with faster response time.
- Faster response time, keyboards customized to meet application requirements and other ergonomic features add up to high operator productivity.
- Value-added terminal workstations assure greater control of the aftermarket for your products.

Get Off-the Shelf, and Back into Business
Custom configuration. Quality. And lower cost of ownership. They're three important reasons why more and more companies are coming to Zentec for intelligent solutions to information processing problems. Companies like R.C.A., G.T.E., Tandem Computers Incorporated, McDonnell Douglas, and United Press International. For more good reasons, send in the coupon below. Or call us at (408) 727-7662. It may be one of the most intelligent moves you've ever made.

ZENTEC
2400 Walsh Avenue, Santa Clara, CA 95050
(408) 727-7662

Sales Offices: Long Grove, IL (312) 634-9550; Playa Del Rey, CA (213) 822-0278; Richardson, TX (214) 690-9265; Rockville, MD (301) 762-7990; Santa Clara, CA (408) 727-7662; Waltham, MA (617) 890-7915; White Plains, NY (914) 428-2801; West Palm Beach, FL (305) 684-4698

OK Zentec, tell me more about your intelligent alternatives. Please —
☐ Send me product literature.
☐ Have a Zentec representative contact me.
☐ Call me at ( ) _____
Name: _____
Title: _____
Company: _____
Address: _____
City: _____ State: _____ Zip: _____
CW4

Univac Users Get Printers For UTS Units

GAITHERSBURG, Md. — Printer Systems Corp. has announced a series of 30 char./sec to 1,000 line/min printers for Sperry Univac UTS 40, 400 and 4020 terminals.

The line consists of three letter-quality printers, a dual-mode draft/correspondence printer and several dot matrix printers ranging from 200 to 300 line/min and three bandwidth printers that range from 300 to 1,000 line/min, the vendor said.

The printers are connected to the 8-bit I/O port of the user's terminal. The printers can also be used to emulate the Univac DCT-1000 printer in conjunction with a Uniscope 100 or 200 CRT terminal, the vendor said.

Printers cost between $3,114 and $13,622. Printer Systems said from Suite 104, 1 W. Deer Road, Gaithersburg, Md. 20760.

Power Unit Protects Gear

SAN DIEGO, Calif. — An automatic power system for protecting equipment against loss of primary ac power is available from the Powermark Division of Topaz, Inc.

The power system reportedly provides blackout protection for applications such as point-of-sale terminals, security systems and small computer systems.

The power system consists of an internal 20A battery, a battery charger, a static inverter and a power transfer switch.

When primary power is lost, a transfer switch transfers the load from the ac line to the system's inverter, the vendor said. The inverter then converts battery power from dc to ac for powering the critical load. When line voltage is restored, the load is transfered back to the ac line and the battery recharger recharges the battery.

Standard features of the 300 VA device include overload protection, short-circuit protection and reverse-polarity protection, according to the vendor. Price for the power system starts at $690.

Additional information is available from the firm at 3855 Ruffin Road, San Diego, Calif. 92123.

PERFORMANCE

We can help.

One key to being s superior performer is anticipating your next move, looking forward, while at the sams time putting your full effort into the present.

To keep you snd your computer system competitive, Storage Technology Corporation is investing heavily in new technology designed for performance.

This investment is slready paying you dividends in the form of intelligent peripherals that migrate functions out of your computer.

Consider, for example, the 4305 Solid State Disk, s dedicated paging system that can improve page response as much as 500%. Or the Impact 2250, s quality band printer that's up to 12.5% faster than its competitor. Or consider the 8360, a fixed-media disk that's available now to improve I/O response as much as 45%.

The recently introduced "Sybercachs" intelligent disk controller snticipstes CPU requirements, fetches needed information, and is prepared to supply data as it is requested.

Designing intelligence snd reliability into subsystems explsins why Storage Technology hss been able to double large system I/O performance over the last few years. Our newest products offer you even greater cost performsnce improvements.

To find out how your computer system can benefit from Storage Technology performance, contact your local marketing representative today. Or write: Storage Technology Corporation, 2270 South 88th Street, Louisville, CO 80027. Phone: (303) 673-4063.

Storage Technology Corporation

Off-Site Storage Center Boasts Maximum Security

PALO ALTO, Calif. — A maximum security off-site storage center for business computer files has recently been opened here by Keep-Safe.

The center, located on a peninsula, offers protection for the irreplaceable business records, archival files and master and backup information of San Francisco Bay Area companies, according to a company spokesman.

The firm accepts information stored on tape, disk or cartridge and incorporates safeguards from fire, theft deterioration or sabotage. Materials are stored in a state-of-the-art vault, a spokesman said. The vault's alarm system is connected directly to the Palo Alto Police Department. Protection systems include a fire suppressing Halon gas system and a temperature- and humidity-controlled environment said to prevent deterioration.

Finally, the vault has "earthquake-resistant" 18-in. concrete walls that provide added protection against damage, loss or intrusion, according to a spokesman.

The off-site storage program also includes door-to-door pickup and delivery of materials by bonded drivers and around-the-clock accessibility.

Keep-Safe is headquartered at 255-A University Ave., Palo Alto, Calif. 94301.

Spur Cuts Costs On Its 1403-NI

LOS ANGELES — Spur Products Corp. has cut prices on the remanufactured models of its IBM 1403-N1 high-speed impact printers.

The 1,100 line/min printer now costs $10,000, down from $12,000, the company said.

In addition, Spur has cut the price on its controller for the 1403-N1 from $20,125 to $18,000.

A combination remanufactured 1403-N1 plus a new Spur controller costs $28,000. That combination formerly cost $32,125, Spur said.

The firm is located at 1904 Centinela Ave., Los Angeles, Calif. 90025.

Applicon Debuts Series 4000

(Continued from Page 57)

Although all three systems will not be available until June, one of the machines — the high-end 4275 — has reportedly already been sold to an unidentified user who purchased the display model used at the system's press debut.

Incorporate Perl

The 4640 and 4650 workstations, offered for all three systems, have either a 19-in. black-and-white or eight-color display. Each supports up to 512K bytes of microprocessor memory and offers high-resolution raster graphics. The terminals also optionally incorporate Applicon's just-unveiled Perception-Enhanced Resolution Logic (Perl).

Perl is said to minimize the stair-stepping effect normally associated with curvilinear and off-axis graphics on raster displays, the spokesman said.

Additional workstation capabilities include support of 256 color-shaded graphics for Applicon's Solids Modeling software, introduced last year.

The terminal's tabletops are also human-engineered, featuring adjustable surface levels, rounded table edges, low-glare surfaces and enlarged knee wells, according to the spokesman.

On the software side, Applicon's distributed graphics network (DGN) provides both local and remote communications between CAD/CAM systems sharing the same data base, the spokesman stated. The software supports such industry-standard protocols as DEC's Decnet and IBM 2780/3780 and Hasp.

The firm's DBMS is a Codasyl-compliant management system that allows a variety of design activities to take place and be linked during the product development cycle. The Series 4000 DBMS extracts data from the CAD/CAM data base for project management, inventory management, cost analysis and manufacturing planning information.

By doing this, it reportedly allows users to integrate more effectively previously scattered design functions.

Finally, the firm introduced both a graphics language and an extended graphics capability. The Applicon Graphics Language was designed to speed the development of graphics programs by building graphics functions and data types directly into the language.

The firm's extended graphics editor provides a single-syntax software package for two- and three-dimensional graphics creation, editing and manipulation, according to a spokesman.

The Model 4225 GPF costs $99,500, while prices for the 4245 and 4275 start at $172,000 and $160,000, respectively. The 4640 workstation costs $40,000 and the 4650 workstation costs $70,000.

All the software will not be available until later this year. Pricing will be released at that time, the spokesman said.

Additional information on the Series 4000 is available from Applicon at 32 Second Ave., Burlington, Mass. 01803.

Color Retro-Graphics.
Our Terminal Enhancements
Cross Yet Another Frontier.

For over three years now, Retro-Graphics™ terminal enhancements have transformed some of today's most popular alphanumerics terminals into impressively-featured graphics terminals. Now Digital Engineering, the pioneer in graphics upgrades and creator of Retro-Graphics, has taken its successful idea and made it a colorful one as well. An idea that makes sense to the business and scientific communities alike, by making sales and financial charts, as well as complicated engineering drawings, easy to produce—and startlingly easy to afford.

Introducing the DE800 Retro-Graphics Enhancement for the Datamedia® Colorscan™ Terminal.

Here is a formidable tool. Eight colors, chosen from a 64-color palette, can be selected and displayed at once. And thanks to a high-quality 640 x 480 resolution, graphics images are displayed crisply and vividly. There is, of course, Tektronix® 4027 graphics terminal emulation, fully software compatible with ISSCO's® DISSPLA® and TELLAGRAF® and Tektronix PLOT 10® The enhanced Colorscan terminal does vector and arc drawing, point plotting, text generation, area fill and shading patterns, thus allowing complex graphics functions to execute with a single instruction. Graphics input options include a light pen for selecting and altering screen objects as well as a bit pad for fast entry of X-Y coordinates. And for color hard copy, the Retro-Graphics DM800 interfaces to a variety of printers, plotters and cameras.

Other Retro-Graphics terminal enhancements are available for Lear Siegler's ADM-3A and 5 Dumb Terminal® displays, TTs 940 Electronic Video Terminal and DEC's® VT100™ and VT125™ Terminals.

Still of the Above for Well Below the Competition.

High-quality, high-power color graphics at a price thousands of dollars less than competitive products. Suggested retail price for the Retro-Graphics enhanced Colorscan terminal is actually under $5000. Call your Digital Engineering distributor today for more information, or contact us directly.

DIGITAL ENGINEERING
880 Sarcee Drive, Sacramento, CA 95814
(916) 447-7000, TWX: 910-367-2089

Retro-Graphics™ and Color Retro-Graphics™ are trademarks of Digital Engineering, Inc. Datamedia® and Colorscan™ are trademarks of Datamedia Corporation. Tektronix® and PLOT 10® are trademarks of Tektronix, Inc. ISSCO® DISSPLA® and TELLAGRAF® are registered trademarks of Integrated Software Systems Corporation. Dumb Terminal® is a registered trademark of Lear Siegler, Inc. DEC,® VT100™ and VT125™ are trademarks of Digital Equipment Corporation.
©1981 Digital Engineering, Inc.

Use Bit-Splice Technology

GA Releases High-Performance Minis

ANAHEIM, Calif. — A series of high-performance minicomputer systems that incorporate bit-slice technology, gate-array logic chips and optional cache memory have been announced by General Automation, Inc. (GA).

The Series 900 computers are said to be up to 1½ times more powerful and 12% less expensive than the firm's previous high-end Solution Series 16/200 and 16/400 processors.

The Series 900 consists of five basic models: the 910, 920, 930, 940 and 950. All use GA's Control operating system and are software-, I/O controller- and peripheral-compatible with the approximately 30,000 previous-generation GA systems installed worldwide, a spokesman said.

The Single-Bay Model 940

Basically, the new series differs from past GA systems in that it reportedly has a redesigned architecture complete with bit-splice processing technology for implementation of existing instruction sets and software compatibility; gate-array logic chips, which are said to improve system reliability; and a cache memory, which improves the system by acting as a traffic mediator between the CPU and the user's peripherals.

The systems also include an expanded chassis that can handle up to 2M bytes of main memory, GA's memory management system, additional I/O slots and an I/O expansion drive. In fact, users can add a total of 21 I/O slots by attaching an additional I/O chassis that boasts its own integrated power supply, the spokesman noted.

The entry-level Models 910 and the 920 feature 64K bytes of GA Hypak memory and are said to have up to 1½ times the processing power as GA's 16/200 series processor. However, the multiuser systems can be field upgraded to 1M byte of memory and have optional single- or dual-bay cabinets.

Four Systems

The 930 is said to be subdivided into four systems — the 932, 933, 934 and 935 — each offering differently configured memory. The 932 and the 934 have 128K bytes and 256K bytes of memory, respectively. The 933 and 935 each have the same amount of main memory, but include high-speed cache memories that are said to improve system performance up to 2.6 times that of GA's 16/200 system.

Finally, the single-bay Series 940 and dual-bay Series 950 both incorporate the 930 processor and feature cabinetry designed to comply with recently enacted Federal Communications Commission guidelines and limit the amount of excessive radio frequency interference. Both systems offer the same memory specifications as the Model 930.

The Series 900 machines range in price from $6,995 to $20,950 for a 256K-byte Model 950 with cache memory. Delivery is in 90 days from GA, 1055 S.E. East St., Anaheim, Calif. 92805.

CIE Unveils Small Business Systems; Incorporate 16-Bit Micros, Multibus

IRVINE, Calif. — CIE Systems, Inc., a subsidiary of Japanese-based C. Itoh Electronics, Inc., has unveiled a series of single- and multiuser small business systems that incorporate both 16-bit microprocessors and Intel Corp.'s Multibus communication bus.

The Cies 680 systems are also software-compatible with Bell Laboratories' Unix System III and Motorola, Inc.'s Versados operating systems. It also supports Pro-IV, an applications processor that allows nonexpert users to easily generate customized business software, a spokesman said.

The systems are designed in the U.S. but manufactured overseas by Hitachi & Co., Ltd. Consumer Products Division.

The 680/20 Multiuser Workstation

Three Machines

The 680 family presently consists of three machines: the entry-level 680/10, a single-user system with up to 256K bytes of random-access memory (RAM); the 680/20, a four-user system with up to 512K bytes of memory; and the top-of-the-line 680/40, which supports 16 users and offers up to 768K bytes of RAM.

The 680/10 is an integrated workstation with a built-in microprocessor-controlled CRT, 10M bytes of Winchester hard disk storage, a floppy disk back-up drive, three serial RS-232C ports and one parallel printer communications ports.

The unit has a six-slot Multibus chassis. Five slots are reserved for a variety of modules and controllers that control memory, communications and the system's disk drives. The optional sixth slot can be used to plug in an additional 128K bytes of memory, as a custom communications interface or to support any Multibus-compatible interface board, a spokesman said.

The system's memory is constructed with 64K-bit chips, has a 200 nsec cycle time and has byte-parity generation and detection facilities. The communications module has programmable full- or half-duplex data rates from 50 to 19.2K bit/sec. Finally, the disk controllers can each support up to four floppy or Winchester disks.

The system is said to be designed from an ergonomics standpoint. The CRT offers many of the same features of Digital Equipment Corp.'s VT52 terminals, such as smooth scrolling, a soft set-up mode and a low-profile detachable keyboard. The screen also incorporates a green phosphor tube or optional amber display.

The 680/20 is architecturally similar to the 10, except it offers more memory and greater flexibility, the spokesman continued. The system can handle from one to four users, has from 256K to 512K bytes of memory and can support two secondary

(Continued on Page 62)

Features 15M-Byte Storage

Desktop Series Handles Five Users

SAN JOSE, Calif. — Durango Systems, Inc. has introduced a series of fully integrated desktop computers that reportedly can handle up to five users and features up to 15M bytes of Winchester disk storage.

The Durango 900 series machines — the 900 and 900XR — consist of a keyboard, printer, CRT and disk drives packaged into a system not much larger than a typewriter. In business applications, the computers function as stand-alone desktop systems. However, the systems can also be used as intelligent terminals in a five-station network to communicate with other computers, including large mainframes, a spokesman said.

The system's standard 15M-byte Winchester disk drive can store roughly the equivalent of 7,000 pages of typewritten information. Auxiliary fixed disks are also available to add another 7M or 14M bytes of storage, the spokesman added.

The system includes a bidirectional dot matrix printer that can operate at speeds up to 200 char./sec. The 900 series software includes Durango's small business applications, a collection of general accounting packages and the firm's Startext word processing program.

The prices for the 7M-byte system begin at $11,950. The prices for the 14M-byte system start at $13,450.

Durango Systems is located at 3003 N. First St., San Jose, Calif. 95134.

Mini Bits

Delphi Announces Unit For Insurance Agents

NORTH HOLLYWOOD, Calif. — A management information system for insurance agents has been introduced by Delphi Systems, Inc.

The Standard Insurance Management System (Sims) allows agents and brokers to eliminate much of their paper handling and active paper files, the firm said.

The system includes a Data General Corp. Nova minicomputer and Sims software. Prices, including installation and training, begin at under $50,000, a spokesman said from the firm at 4605 Lankershim Blvd., North Hollywood, Calif. 91602.

Series/1-Based Turnkey Manages Oil, Gas Leases

SAN ANTONIO, Texas — Jack C. Hollimon, Inc. has announced Oilman, a turnkey in-house oil and gas lease management and accounting system employing an IBM Series/1 processor.

Features include lease and rental management, joint-owner billing, accounts receivable, general ledger, payroll and accounts payable, the vendor said.

A turnkey system costs $65,785. The vendor can be reached through Suite 7, 5168 Broadway, P.O. Box 6580, San Antonio, Texas 78209.

Uninterruptible Power Unit Touts 80%-Plus Efficiency

HILLSBOROUGH, N.C. — Wilmore Electronics Co. has announced an uninterruptible power supply, the 1,000-W Model 1409.

The unit reportedly consists of a dc/ac inverter, battery charger and sensor and line inverter transfer circuitry. The inverter has an efficiency of more than 80% and comes with a 2:1 (200W) surge capability. The unit has a frequency stability of ±0.15 Hz. It can respond to changes in commercial power within 16 msec, the vendor said.

Model 1409 costs $1,250 and can be ordered from the firm through P.O. Box 1329, Hillsborough, N.C. 27278.

Tape Controller Features Microprocessor Intelligence

SANTA CLARA, Calif. — Data Technology Corp. has introduced a controller that supports up to four 8-in. Winchester drives, one tape cartridge drive and one floppy drive.

The Winifloppy tape controller reportedly features microprocessor intelligence, single-board design and supports a host adapter for any microcomputer, including those offered by Digital Equipment Corp. and Apple Computer, Inc. The controller also includes single-command disk save/restore, automatic seek and verify and error detection.

Winifloppy costs $1,100 from Data Technology Corp., 2775 Northwestern Pkwy., Santa Clara, Calif. 95051.

Winchester Disk Storage Replaces Systems' Floppies

SAN LEANDRO, Calif. — North Star Computers, Inc. has announced that its Advantage system can now accept a 5¼-in., 5M-byte Winchester disk storage system.

The disk drive is attached in place of one of the system's floppy disk drives. It reportedly gives added memory to users of the firm's Graphics CP/M and Graphics Basic/DOS operating systems. This allows those users to run more complex operations, the vendor said.

An Advantage system with 5M bytes of disk storage and 360K bytes of floppy storage costs $6,599, the firm said from 14440 Catalina St., San Leandro, Calif. 94577.

DEC Q-Bus Systems Gain Parity Control Module

SANTA ANA, Calif. — The Standard Memories Division of Trendata Corp. has announced the MPC-148, a parity control module that is said to be compatible with Digital Equipment Corp. Q-Bus systems.

The board was designed to add parity control and status register to existing Pincomm 23 memory modules offered by the firm. The parity control module can be set to 18- or 22-bit addressing applications.

The unit costs $350, the vendor said from 3400 Segerstrom Ave., Santa Ana, Calif. 92704.

CIE Introduces Business Tools

(Continued from Page 61)

disk storage enclosures for a total capacity of 20M bytes of Winchester and 640K bytes of floppy disk storage — double that of the 680/10. The mid-range system can also be linked to a wider variety of peripherals, including C. Itoh's Model 1550 dot matrix and Printmaster daisywheel printers, the spokesman added.

The high-end 680/40 supports up to 16 users and has a 12-slot Multibus chassis. It can handle up to eight Winchester disk drives for a total capacity of 400M bytes of hard disk storage, has a streaming tape backup and up to 768K bytes of RAM.

All of the systems support such standard software languages as C, CBasic, Pascal, Cobol and Fortran.

Although the CIE computers are primarily targeted at OEMs and systems integrators, they are also available for medium- to large-scale end users. Prices for the systems range from $5,500 to $12,000. Operating systems software is available at separate and competitive prices, the spokesman added.

The three systems are scheduled to be shipped in June from the firm at 2515 McCabe Way, P.O. Box 16579, Irvine, Calif. 92713.

Introducing Used Software.

WORD-11 for VAX.

And what is used word processing software, you ask? Nothing more than 800 installations throughout the world. Software so thoroughly tested, so well thought-out, and so completely debugged that you'll wonder why you ever considered using any other system than ours.

At Data Processing Design, we've developed a superb word processing system for Digital Equipment Corporation's family of minicomputers. A system that's versatile, yet simple to learn and operate. Uses inexpensive terminals. And has the capability to handle the largest, most complex word processing applications.

It's called WORD-11,™ and now it runs on VAX.™ The system provides a high degree of sophistication, yet requires only a standard VT52,™ VT100™ or compatible terminal for truly efficient word processing.

Now WORD-11 operates as a system of programs under Digital's VAX/VMS™ operating system. The software is written in assembly language for enhanced performance, and the primary modules include Main Menu, Editing, Printing, List Processing, and Spelling Error Detection. Each module thoroughly used, tested and ready to improve productivity in your installation.

So give us a call at Data Processing Design. We want you to find out why so many people use us.

Software that's designed to be used.

Data Processing Design, Inc.

AUTHORIZED DIGITAL COMPUTER DISTRIBUTOR

CORPORATE OFFICE
181 W. Orangethorpe, Suite F
Placentia, CA 92670
714 993 4160 Telex 182-278

NY OFFICE
420 Lexington Avenue, Suite 655
New York, NY 10170
212 687-0104

WASHINGTON DC OFFICE
4520 East-West Highway, Suite 550
Bethesda, MD 20814
301 657 4098

WORD 11 is a trademark of Data Processing Design, Inc.
VAX, VT52, VT100, VMS are trademarks, and remaining titles are products or trademarks of Digital Equipment Corporation.

Desktop Systems Feature Integral Hard Disk, CP/M

CAMPBELL, Calif. — Eagle Computer, Inc. has announced two desktop computer systems that feature integral hard disk storage and use Digital Research, Inc.'s CP/M operating system.

The Eagle IV and V both have 64K bytes of memory — more than previous versions of the Eagle — and allow users to utilize a number of business programs, the vendor reported. The Eagle IV offers 7.5M bytes of formatted hard disk storage capacity and the Eagle V provides 15M bytes of formatted hard disk storage.

According to the vendor, the systems compete with Altos Computer Systems, Inc. Model 8000-10 desktop computer, but are said to offer more hard disk storage. The Eagles also compete with other desktops offering integral Winchester hard disk storage.

The new models are priced at $8,995 and $9,995, respectively.

More information is available from the vendor at 501 Vandell Way, Campbell, Calif. 95008.

Tape Adapter Interfaces With PE System

ANAHEIM, Calif. — A microprocessor-controlled streaming tape adapter that is reportedly compatible with Perkin-Elmer Corp.'s operating system and diagnostics has been unveiled by Macrolink, Inc.

The Steamer Tape Adapter is said to interface with industry-standard ½-in. streaming tape drives. The half-board device is compatible with PE systems as well as with streaming tape peripherals offered by Cipher Data Products, Inc.; Control Data Corp.; and Kennedy Co, according to the vendor.

The Streamer Tape Adapter is said to have extended command and status functions that enhance the streaming function. It comes with 20 ft of cables and documentation and sells for $1,500, according to the vendor.

Macrolink is headquartered at 1150 E. Stanford Court, Anaheim, Calif. 92805.

Intel Bus Gets Memory Boards

ROCKVILLE, Md. — Two nonvolatile memory boards for Intel Corp.'s Multibus have recently been introduced by Plessey Microsystems, Inc., a division of Plessey Trading Corp.

The PSM 6463/100 reportedly offers a 64K-byte Multibus random-access memory (RAM) with a typical data retention period of eight years. The memory board uses ultra-low standby current, 16K-byte RAM memory chips and lithium cells for a long-life power source, a spokesman said.

No recharging is required and data is retained even if the boards are unplugged from the system, a spokesman said. Boards are also available in 16K-, 32K- and 48K-byte versions, the vendor said.

The 6463/100 memory board sells for $2,350.

Also released by the company was PSM 512A, a .5M-byte Multibus memory.

This product is said to be downward compatible with the existing PSM 512, but it also features decreased access and cycle time, I/O access to interrupt and error status, enhanced address mapping and is optimized for 8MHz CPU operation.

The PSM 512A costs $3,500 and is scheduled for delivery in May from Plessey Microsystems at 451 Hungerford Drive, Rockville, Md. 20850.

Multimode Dot Matrix Printer Features High-Speed Printing

HAUPPAUGE, N.Y. — A multimode serial dot matrix printer has been unveiled by the Qantex Division of North Atlantic Industries, Inc. that boasts high-speed, letter-quality printing and graphics capabilities.

The Model 7030 printer operates in any one of five selectable modes, with any of nine fonts. All modes are switch-selectable and programmable. An on-board read-only memory stores the 7030's font library with characters in U.S. Ascii as well as seven European versions. Each of its four character print modes — 180-, 150-, 75- and 37 char./sec — has a different horizontal resolution that affects the quality of the printed character, a spokesman said. The fifth mode is the graphics mode.

Two interfaces reside in the Model 7030: a Centronics Data Computer Corp. parallel interface and an RS-232 serial interface. The serial interface supports transmission rates ranging from 110 bit/sec to 19,200 bit/sec.

The printer is escape-code-compatible with Digital Equipment Corp.'s LA120, LA180 and LA34.

The single-quantity price of the Model 7030 is $1,995. The vendor is based at 60 Plant Ave., Hauppauge, N.Y. 11788.

Terminals, Peripherals, Accessories & Supplies?

We've got'em!

(And we back 'em up.) We'll get 'em on their way to you within 24 hours. At the right price. In time. On time. Every time. And if you have a problem — you have a no problem return with C&TE.

DEC Terminals

VT100	$1,325.00
VT101	995.00
VT102	1,425.00
VT131	1,495.00
VT132	1,500.00
VT103-AA	1,850.00
VT103-BA	2,395.00
VT125	2,930.00
VT18X	2,050.00
LA34-AA	950.00
LA34-DA	925.00
LA34-RA	925.00
LA34-VA	990.00
LA34-WA	1,055.00
LA36-DK	950.00
LA100-RA	1,625.00
LA100-ZA	1,950.00
LA120-AA	1,995.00
LA120-BA	2,075.00
LA120-DA	2,359.00
LA120-RA	1,795.00
LP11-AA	7,500.00
LP11-BA	7,800.00

Call us for pricing at 904/434-1022.

DEC Peripherals

MK11-BE
11/04-DC
ADV11-A
DD11-CK
DH11-AD
DL11-WB
DR11-C
DUP11-DA
FP11-A
FP11-F
H775-CA
KDF11-AA
KEF11-AA
KW11-K
KY11-LB
MS11-MB

Also, RX02, RL01, RL02, RK07 Disk Drives and Controllers IN STOCK. Call us for pricing at 904/434-1022.

Accessories & Supplies

DEC RL01K-DC	$145.00
DEC Compatible 4443(RL01K-DC)	$125.00
DEC RL02K-DC	$165.00
DEC Compatible 4443-2(RL02K-DC)	$155.00
DEC RK07K-DC	$400.00
BC03M 25' cable	$ 40.00
BC03M-AO 100' cable	$100.00
DEC RM03-P	$590.00
DEC Compatible 4464-2(RM03-P)	$350.00
DEC RM05-P	$1,350.00
DEC Compatible 4473-2(RM05-P)	$1,250.00
DEC DF03-AA modem	$900.00
DEC VT1XX-ST VT100 stand	$110.00
Dual Density Diskettes	$4.75
Magnetic Tape — 2400' in seal	$18.50

Call us at 1/800-874-9748. (In Florida, 904/434-1022.)

UCC COMPUTER & TERMINAL EXCHANGE A DIVISION OF UNIVERSITY COMPUTING COMPANY

We're The Suppliers. Call us at 904/434-1022.

114 East Gregory Street • Pensacola, Fla. 32501 • Distribution centers in major cities

DEC is a registered trademark of Digital Equipment Corporation.

Kodak introduces the microfilmer that speaks computer.

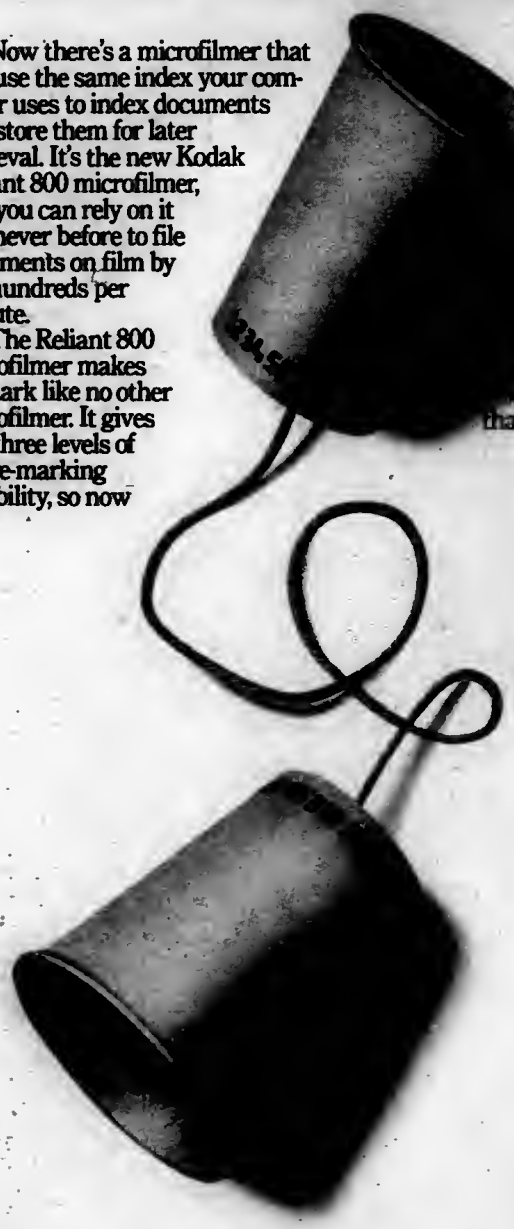
Now there's a microfilmer that can use the same index your computer uses to index documents and store them for later retrieval. It's the new Kodak Reliant 800 microfilmer, and you can rely on it like never before to file documents on film by the hundreds per minute.

The Reliant 800 microfilmer makes its mark like no other microfilmer. It gives you three levels of image-marking capability, so now you can film documents before or after data capture, and you can retrieve that data quicker and more accurately than ever before.

Very simply, the Reliant 800 microfilmer is the state of the art in reliability, flexibility, speed, ease of operation and, ultimately, productivity.

Whether you're in a retail, financial or industrial situation, the Reliant 800 microfilmer can save you time and money in the processing and storage of the avalanche of paper documents that make up today's business environment.

To find out more of what the new Reliant 800 microfilmer can do for you, just fill out the coupon.



© Eastman Kodak Company, 1982

YOUR CO[illegible]
A PHOTOG[illegible]HIC
MEMORY.

Electronic Filing from Kodak.

Eastman Kodak Company, Business Systems Markets Division, Dept. DP2548, Rochester, N.Y. 14650.

☐ Please send me more information on the new Kodak Reliant 800 microfilmer.

☐ Please have a Kodak representative contact me.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Infomedia Puts Electronic Mail On HP 3000

SAN BRUNO, Calif. — An electronic mail communications package for the Hewlett-Packard Co. HP 3000 computer has been announced by Infomedia Corp.

Zap/3000 is said to enable users to send, file and electronically transmit correspondence, reports and other information. Messages are entered via keyboard, processed by the HP 3000 and sent to terminals in other offices or countries, according to the vendor.

Communications are automatically filed and can be retrieved according to sender, date or subject. Designed for nontechnical users, Zap/3000 features five single-key commands.

The software runs on any HP 3000 with 128K bytes of memory and Ksam files plus standard disk and asynchronous peripherals. The Zap/3000 software costs $2,000 from Infomedia, Suite 275, 801 Traeger Ave., San Bruno, Calif. 94066.

'Multiword' Gets Update for NCR

CINCINNATI — Delphi Data Systems, Inc. has shipped a new release of its Multiword word processing software designed for users of NCR Corp. IDPS/Imos/IRX and VRX sites.

Release 3.0 is said to include tabbing, subscripting, superscripting, underlining and bold-face typing. New management reporting aids have improved the document catalog subsystem, according to the firm.

A perpetual license fee for Multiword is $1,975 for IDPS/Imos/IRX sites and $2,975 for VRX sites. There is a 30-day unconditional guarantee on the software from Multiword's exclusive sales agent, The Software Clearing House, 771 Neeb Road, Cincinnati, Ohio 45238.

Magna SL Gets Math Capability

CHICAGO — A.B. Dick Co. has added a five-function math capability to its Magna SL word processor.

Five-function math reportedly enables the Magna SL to perform four-function numeric calculations and percentages. In addition, add, subtract and multiply modes for percentages can be utilized.

The word processor consists of a text-editing CRT terminal with full-page display, a 550 word/min printer and a central word processing unit. It costs $14,500, A.B. Dick said from 5700 W. Touhy Ave., Chicago, Ill. 60648.

Power Conditioner Out For WP, Small Systems

SAN DIEGO — A power conditioner for word processors and small systems in business environments is available from Topaz Electonics Division.

The Line 2 is said to be a self-contained, portable unit that combines noise attenuation with voltage regulation.

It costs $430 from Topaz Electronics Division, 9192 Topaz Way, San Diego, Calif. 92123.

Grade Levels Seen Way To Lure Top Employees

By Bruce Hoard
CW Staff

SEATTLE — Word processing/information processing managers should make sure that their organizations hsve grade levels for both existing and potential jobs if they want to attract top-quality employees, according to Janet Kleinmeyer. The systems marketing program manager for Xerox Corp. told attendees at the Word Processing Information Exchange Conference here recently to start working with their personnel departments well in advance of the time they bring new employees on the job.

One good reason for establishing grade levels for all possible jobs is the effect it has on employee morale, Kleinmeyer said. If workers see a well-defined career path, they are more likely to stay with the company and try to upgrade themselves, she maintained.

Another reason for grade levels is the fact that managers can promote deserving workers more quickly if there is an actual job position waiting for them. "You know if you've done it what a tough job it is to work with those people," she said of personnel departments.

She qualified that statement by saying that personnel departments work hard, but that despite their best efforts it can still take from 12 to 15 months to get a job description approved.

Scope and Purpose

Kleinmeyer suggested that each job classification describe the scope and purpose of the position, including specific duties and responsibilities, as well as the amount of authority involved and the person to whom the employee will report. If in doubt about putting the classification together, go to the personnel department for help, she advised.

Other factors to consider are affirmative action and equal employment requirements. "When you put together a job description, just be very cautious," Kleinmeyer observed.

When interviewing potential employees, there are several important questions to ask such as asking the candidate to describe a typical day on the current or immediate past job — that should separate the more qualified aspirants from lesser qualified ones, she said. According to Kleinmeyer, managers should also ask job seekers what attracted them to their jobs. Answers to that question will help establish how much they need to be motivated and their attitudes about work.

The next question to ask is, "What where your most significant accomplishments on your job and what aspects gave you the most trouble?" She urged interviewers to be careful about assessing the answer to this question because some introverted types may be discouraged by the lack of feedback they received in the past and feel they have accomplished little, while they may have acquitted themselves admirably.

After hiring someone, "I can't tell you enough how you must be prepared to spend time with them," Kleinmeyer emphasized. Begin by orienting the person to the policies and procedures of the group they will work in and informing them of the overall goals of the organization.

A useful tool for orienting new workers is a procedures manual, which should contain general information, systems procedures, applications procedures and advanced applications, she said. General information covers such items as work hours, priority tasks and when and in what form word processor operators are to accept work requests.

Systems procedures should identify the work flow, Kleinmeyer said, suggesting a flow chart. "There's nothing better in telling people a story than a picture," she reminded the conference audience: The flow chart shows operators where they fit in and the flow of documents. "It shows them how they're an integral part of the system," she added.

In the area of applications procedures, she advised her audience to establish uniform keyboard procedures to eliminate confusion when different people work on the same document from month to month. She also recommended that individuals take care of their own media filing, but noted items in short-term storage — up to three months — should be readily available to other workers who may need them.

Sample documents are good aids for newcomers: "It's amazing how you learn people have a way of not saying what they think," she said.

Oregon Show Set for April 20-21

PORTLAND, Ore. — The Portland chapter of the Data Processing Management Association (DPMA) and International Information Word Processing will present the annual Data Processing and Word Processing Equipment Show and Symposium here April 20-21.

The symposium will feature addresses from DP and WP professionals on information systems and management-related topics. More than 80 vendors are expected to display their wares at the exhibit.

The hardware exhibit is free and prices for the symposium range from $35 for one half-day to $110 for two days. More information is available from DPMA through P.O. Box 443, Portland, Ore. 97207.

Xerox 860 Now Takes Long Paper

DALLAS — An applications software package for handling long-documents processing on the Xerox Corp. 860 Information Processing System has been announced here by Xerox.

The long-documents package reportedly enhances text processing with features such as footnoting within documents, paragraph numbering, leaders and line numbering. The footnote program is said to automatically merge or delete footnotes and renumbers. The line-numbering program numbers consecutively or at operator-selected intervals at the left or right margin.

The paragraph-numbering software offers outline and decimal specification formats. The table-of-contents and dot-leadering programs compile chapter headings and titles along with corresponding page numbers and leadering symbols.

One-time license fee for the long-documents package is $500. Deliveries will begin in May, according to the vendor at 1341 W. Mockingbird Lane, Dallas, Texas 75247.

Now you can order everything from IBM lift-off tape to IBM magnetic tape without a lot of red tape.

Announcing the IBM Systems Supplies Division.

Supplies. They're what keep your business running and humming. They help fuel the performance of every typewriter, computer and copier. And they help keep the wheels of productivity turning.

It's your mission to monitor these essential components so no momentum is lost. It's our aim to make it easier for you.

That's why we've created the IBM Systems Supplies Division as the single source for your IBM supplies. It's a division of people dedicated to providing your IBM equipment with products that aid performance and efficiency.

Now you can order your IBM supplies, accessories and office furnishings simply by phoning IBM Direct toll free at 800-631-5582.*

IBM representatives at this number are prepared to take your IBM supplies orders, or put you in touch with your nearest IBM/SSD branch office for specific answers to technical questions about your IBM supplies needs.

We want your IBM office and data processing equipment to get the kind of supplies that it deserves, while you get the sort of service and attention you deserve.

The IBM Systems Supplies Division does just that and only that. And that's why we can do it so well.

For a free IBM Computer & Office Supplies and Furnishings Catalog, call IBM Direct toll free at 800-631-5582* or mail this coupon today. You'll receive a full description of our extensive product line, as well as information on money saving special offers.

I have ☐ have not ☐ received an IBM catalog in the past.

NAME_____ TITLE_____

COMPANY_____ TEL._____

STREET ADDRESS_____

P.O. BOX_____

CITY_____ STATE_____ ZIP_____

*(in New Jersey 800-352-4960 & in Hawaii or Alaska 800-526-2484)

Mail to: IBM Corporation, Systems Supplies Division, Attn: IBM Direct, 1 Culver Road, Dayton, NJ 08810

CW 6

IBM

THE FAULT TOLERANT REVOLUTION

(Or how the Stratus hardware solution has made the software fault tolerant solution obsolete.)

Software means programmers, and programmers are expensive. It's plain to see that if you invest in a software-based fault tolerant system you also get a ball and chain in the form of ever increasing expenses and performance penalties.

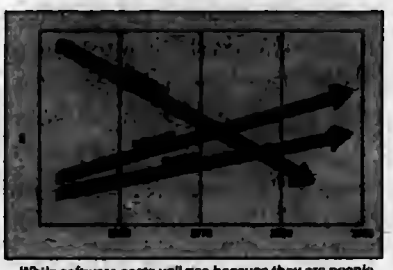
When the first fault tolerant computers were designed, software was the way to go. Hardware was expensive. But in the last 5 years there has been a dramatic reversal. People costs are going through the roof, while hardware components are the bargain of modern times. Stratus is the first company to build a continuous processing computer that takes full advantage of the hardware revolution...a computer that is designed to the economic realities of the present and the future.

As opposed to the Stratus hardware fault tolerant solution, the software approach requires performance stealing software in increasing increments. The more reliability required, the more software required, and the greater the burden.

Why more hardware works better than more software.

The crux of the problem with a software-based system is that it requires complex, performance stealing software to provide a system that will not stop. This software "robs" the system of resources because it uses processing cycles to pass status and checkpoint information back and forth between two computers. What's more, this passing of information usually occurs at four levels: operating system, user program, file management, and terminal control.

Stratus has eliminated this software burden with duplicate hardware components tightly coupled, dedicated to performing the same tasks at the same time. It's like having two computers in one, rather than two separate computers. Hardware checking logic continuously inspects for errors. When a failing component is found, it is stopped instantly. This means the Stratus/32 Continuous Processing system can: 1) Prevent a fault from contaminating the rest of the system. 2) Eliminate the need for complex recovery software. 3) Reduce repair time and service costs by pinpointing the failed component.



While software costs will rise because they are people dependent, experts agree that hardware costs will continue to fall.

Meanwhile, the duplicate partner is continuing with business as usual, without interruption.

Hardware is easier to implement.

One of the nasty side effects of software-based fault tolerant systems is that the analyst/programmer has the added complexity of working with two computer systems. Most are not accustomed to working this way. As a result, not only does application development require more time, but there is a constant risk of checkpointing too often, and thus destroying performance.

With the Stratus hardware-based solution, on the other hand, the analyst/programmer might as well be dealing with a conventional computer...one, not two. Stratus provides a familiar environment. The analyst/programmer doesn't have to make an extra effort to get continuous processing. He/she can take it for granted, with no performance penalty.

Stratus open ended growth. You add on, instead of replace.

The Stratus/32 is designed so that you can buy what you need when you need it...not more than you need in order to accommodate future growth. Yet, as you grow, you can *build* on what you have rather than experience the trauma of *replacing* what you have.

The basic building block is the Processing Module (CPU, memory, controllers and I/O). A local system can have as few as 1 or as many as 32 Processing Modules to accommodate almost any size job. And these modules can be added to a system while it is processing.

Stratus has software where it counts.

To complement our hardware approach to continous processing we have an impressive list of software. For instance: Virtual Operating System (VOS), Data Management System, CRT oriented command language, COBOL, Basic, PL/1, Networking with X.25, IBM Communications, full-screen editor, symbolic debugger, and a complete Word Processing package. And since fault tolerance is achieved by hardware, this software is unencumbered with complex "reliability" code.

$130,000. Software included.

A benefit not to be overlooked in the hardware approach to fault tolerance is the price advantage. The Stratus/32 Continuous Processing system is price/performance competitive with conventional computers that *don't offer a fault tolerance capability.* A fully duplexed configuration with 2 megabytes of memory, peripherals, and software can be purchased for under $130,000.

If you are looking for a continuous processing computer, please call our nearest office, send us the coupon below or contact Stratus' headquarters marketing at 617-653-1466, Ext. 32, today.

Stratus Computer, Inc.
17 Strathmore Road,
Natick, MA 01760

Name
Title
Company
Type of Business Phone
Address
City State Zip

Stratus
CONTINUOUS PROCESSING.™

U.S. Semi Vendors Should Manufacture in Japan: Report

HONG KONG — U.S. semiconductor manufacturers are unlikely to make much headway in competing with the Japanese on their own soil. The solution is to set up local manufacturing plants in Japan.

This is one of the major conclusions to emerge from a recent report, "The Japanese Semiconductor Industry 1981/82," published here by BA Asia Ltd., an affiliate of Bank of America.

This report appears to be at odds with another report just released from the University of California at Berkeley [CW, March 22], which accused the Japanese government of imposing restrictions on U.S. semiconductor companies.

The BA Asia report stated that "the Japanese government, to the extent that it can, has taken steps to assure that the market is open; and foreign investment in semiconductor manufacturing and semiconductor equipment is clearly allowed."

However, the report warned that semiconductor imports, as a percentage of consumption, are not going to increase in Japan and are more than likely to decline. It appears that at least a few major U.S.-based semiconductor companies understand this, the report noted. These companies have decided to manufacture products in Japan. More companies will follow this strategy, the report added.

Japanese production of integrated circuits in 1981 rose 17% to just over $4 billion. By contrast, the value of imports in 1981 remained flat at the 1980 level of about $489 million. Imports will probably decrease to 10% of total Japanese consumption over the next several years, down from the current rate of 19% of total consumption, the report forecast.

The most significant activities by American companies include IBM's decision to manufacture integrated cir-

(Continued on Page 70)

Consultant: Impact Of Industry Changes Not Yet Realized

By Marcia Blumenthal
CW Staff

SCOTTSDALE, Ariz. — During the past five years the underlying framework of the computer industry has shifted, but it will take another several years to define the ramifications of that change.

Alluding to the thesis presented in Hakan Tornbohn's book *The Paradigm Shift*, IBM watcher and consultant Burton Grad maintained the entire original set of assumptions that companies have used to counter IBM are no longer valid.

Speaking to a group gathered here recently for a conference sponsored by International Computer Programs, Inc., Grad, president of Heights Information Technology Services, Inc., said IBM has now modified its competitive model. "When IBM went into personal computers, tying in their sales into retail outlets, it abandoned its traditional market model. The odds against [IBM doing] this were

Photo by M. Blumenthal
Burton Grad

ridiculous," he said. That action showed that IBM, in the future, will be much more flexible than it has been in the past, he said.

That flexibility is further evidenced in IBM's increased willingness to establish and expand

(Continued on Page 70)

Citicorp Wins Bid Against Adapso for DP Services

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Citicorp won a significant victory over the Association for Data Processing Service Organizations, Inc. (Adapso) late last month in the banking company's bid to offer more sophisticated commercial DP services.

Adapso had asked the Federal Reserve Board not to relax banking regulations that currently restrict banks to services closely related to traditional banking activities. Citicorp sought a clarification of those regulations to allow specifically its Citibank subsidiaries to offer a greater variety of DP services. The new offerings would include home banking, data transmission, packaged financial systems and access to various business and financial data bases.

On March 29, after more than a year of hearings and testimony, Administrative Law Judge Walter J. Alprin pronounced the Citicorp plans permissible under current law and said the services would have significant public benefit.

While Alprin's findings were a blow to Adapso's long fight to restrict regulated entities in open markets, the decision was not unexpected. Earlier this year the Federal Reserve attorneys participating in the proceeding had arrived at conclusions similar to Alprin's recent decision [CW, Feb. 15].

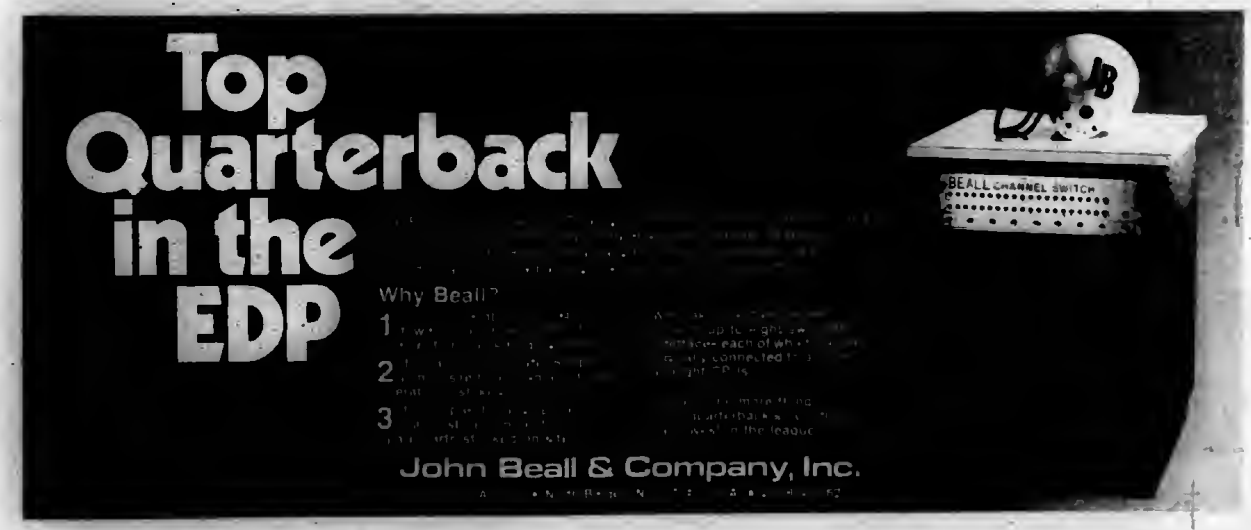
Commenting on the decision, Adapso spokesman David Sturtevant said the association is considering what action it might take to appeal Alprin's decision.

"The best thing I can say about the ruling is that it is certainly very straightforward," Sturtevant said, acknowledging the extent of the association's defeat in the proceeding. He said Adapso will respond to Alprin's recommendations by the end of this week. A court challenge to any action the Fed takes to implement Alprin's decision is also possible, he said.

The issue before Alprin was to decide if the proposed Citicorp activities are, as the bank regulations require, "so closely related to banking or managing or controlling banks as to be a proper incident thereto." The question of public benefit was also considered.

Adapso argued that Citicorp and other large banks would have an unfair advantage over the many DP services that are small and do not have the prestige and financial strength of Citicorp. The associa-

(Continued on Page 70)



Consultant: Effect of Industry Change Not Sure

(Continued from Page 69)

its third-party remarketer program, which offers OEMs significant discounts for certain equipment and its recent move to seek out software from independent third-party software developers.

Until now, IBM has not had success in the small systems areas, Grad continued. Mini vendors demonstrated that high-performance systems with limited support could be sold through OEM vendors. And the marketing methods used by micro firms — retail and mail order — were heresy, but worked. IBM has now started to adopt some of these techniques.

Besides its personal computer offering, IBM has shown its determination to compete in the small-end market in e new way, Grad said, pointing to the firm's recent Small System Executive announcement, which ties the 4321 hardware with software.

Grad also maintained that IBM will evolve its product etrategy for the low end — 4300 line and below — in one direction, offering compatible systems, languages, communications and data bases. No group can market the diverse, noncompatible entities that exist in IBM's low-end offerings, he observed. One clue to this strategy is IBM'e recent reorganization in which it clustered marketing groups around customers rather than sround systems as the firm has dons in the past.

While noting IBM has made its directions in hardware clear, Grad also warned that threats ebound for independent software and service firms, despite the past sbility of these companies to find comfortabls niches in the market.

In the past, these firms were "concerned that the elephant [IBM] might move by mistake. We scteamed so the foot wouldn't come down . . . but we are no longer assured that IBM won't go into software and services," Grad said. The dropping of the antitrust suit egainst the firm is e signal that the market is wide open to IBM.

Grad pointed to IBM's meeting last November with independent software vsndors in which the firm laid out its strategies in more open detail than ever before and offered marketing associations to these vendors [CW, Nov. 9].

But he questioned whether it was wise for vendors to rely on IBM as their principal marketing channel.

"Direct from the Authors"

TP DATA

STREAM COMPRESSION

CTOP®-CICS Transmission Optimizer

- Instantly improves CRT and printer response
  - Extends capacity of entire network
- Reduces line busy and front-end loads
  - Gives new life to slower circuits
- DOS, VSE, VSI, MVS, BTAM, TCAM, VTAM
  - No modifications to anything

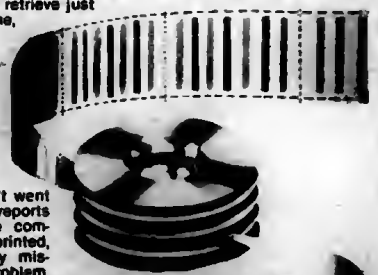
Site license under $3,000

H & W Computer Systems, Inc.
P.O. Box 4173
Boise, Idaho 83704 • (208) 377-0336

SPLITTER FINDS THE WAY...
TO TOTAL REPORT CONTROL

Lost reports? Requests for additional copies? In the past, sn sntire job had to be rerun to retrieve just one report. Weeting time, money, and peper.

With SPLITTER,™ you can pinpoint exactly the report you went. And recreste thet report—or multiple reports—st e minimum of cost. You don't print what you don't nssd.



And often, you don't went to print until multiple reports for ona user can be combined. Because once printed, reports can be sasily misplaced. To solve this problem, SPLITTER provides report consolidation. Selecting specific reports from JES2 output queues before printing, SPLITTER creates an archival file. A file that can be printed all et once for one user.

By creating erchival files, SPLITTER elso frees your JES2 output queues. To accept those "hot jobs" that need to be printed right away.

SPLITTER operates under MVS, VS1, SVS, and MVT. And can be installed without system modifications.

SPLITTER

Try SPLITTER for 30 days, FREE!
For more information write us or call toll-free: 1-800-527-0128
In Texas: 1-800-442-5791

EDS
Software Products
7171 Forest Lane
Dellas, Tx. 75230

Reports Vary on Japan's Role

(Continued from Page 69)

cuits in Japan; Motorola, Inc.'e purchase of 50% of Aizu Toko; Intel Corp.'s establishment of s design and test facility in Ibaragi, Jepan; and Fairchild Camera & Instrument Corp. also announced recently it would begin local production.

"It is clear that the level of serious interest in investment in Japan has increased from e few years ago, but firm commitments have been delayed dus to poor economic conditions in the [U.S.]," according to the report.

The report also concluded that U.S. manufecturers will make no significant gains in Japan while the recession lasts. As long as Japan has edequate domestic capacity, imports will constitute only that portion of demand represented by temporary mix problems, uniqus technology or lower prices for foreign-mede chips.

In addition, the current economic downturn is more severe than the 1974-75 recession prompted by the rapid rise in oil prices. The report said the latest lull in the economy is lasting longer than it did in 1974-75, the interest rate differential between the U.S. and Jepan is greater and Japan's homs market for semiconductors is continuing to expand.

"The overall business picture suggests that the Japanese industry stands in a very strong position. The good news for those foreign makers selling in Japan is thet the market is et least expanding. Ths bad news is that domestic supply is sufficient to cover market increases and that export demand will not strain capacity," the report said.

The report added that still more must be dons to improve the climate in Jepan for selling foreign-manufactured goods. The issue of quality has been raised and remains e long way from being resolved. Moreover, the image projected by suppliers of imported semiconductor goods is far from ecceptable to the Jepanese, the report concluded.

The grip the Jepanese manufacturers have on their own domestic market is illustrated by the fact that the 10 major producers supply 88% of ths home market. Of these, the fivs largest vendors control 68% of the total market share.

According to BA Asia, in 1980 the Japanese spent ebout $448 million on semiconductor research and development. Approximately 8,700 workers were involved in this research. Last year, R & D expenditures rose to sbout $497 million, the report said.

Citicorp Wins Against Adapso

(Continued from Page 69)

tion also warned of the possibility of predatory pricing, which it said might result if banks are tempted to subsidize their DP service rates through banking revenues.

Alprin found, however, that the activities proposed by Citicorp are "either generally provided by banks [already], operationally or functionally similar to activities provided by banks snd/or . . . integrally related to ectivities provided by banks."

These activities, he said, will "produce bensfits to the public, euch as greater convenience, increased competition or gains in efficiency, that outweigh possible adverse sffects, such as undue concentration of resources, decreased or unfair competition, conflict of interest or unsound banking practices."

He added: "Citicorp's sntry will add to ths marketplace innovative capabilities, advanced technology to ths dslivery of financial services and the large-scale investment necessary to bring technological innovations to the marketplace."

As for the effects on established DP services firms, Alprin said the market is so large end the cost of entry so low that no one organization, including powerful and wealthy banks, would be abls to monopolize it.

Unless an organization can reasonably expect to eliminate competitors and reep monopoiy profits to cover prior low prices, "predatory pricing techniques lose economic logic," Alprin wrote.

Alprin's recommended amendment to the banking regulations to ellow specifically the types of financial and business DP services planned by Citicorp must still be spproved by the Federal Reserve.

The recommendations includs restrictions and conditions for offering hardware as à part of e bank's DP offerings.

*May be a registered trademark

"As a leader in the transportation industry with offices in every major city in the United States, Fritz Companies, Inc. has set the standard for performance. In keeping with this tradition, and after a comprehensive evaluation of terminal emulators from other suppliers, we selected Beehive terminals for our on-line customer support system. The 200 Beehive units which we use in our Burroughs network meet our demanding standards for reliability, performance and 'quality' emulation."

The Beehive DM83 features a totally compatible Burroughs MT983* keyboard, up to nine pages of screen refresh, sixteen user-definable function keys with extensive self-test and soft terminal configuration control from the keyboard. The DM83 provides both TDI and RS232C interfaces and supports all major Burroughs polling protocols.

Beehive's reputation for product quality is backed-up by more than 100,000 terminals installed worldwide and a Company-owned, nationwide support organization.

For more information or a product demonstration call the Beehive sales office nearest you.

SALES OFFICES

California, Costa Mesa	(714) 540-8404
California, Sunnyvale	(408) 736-1560
Florida, Altamonte Springs	(305) 788-9000
Illinois, Arlington Heights	(312) 593-1565
Massachusetts, Woburn	(617) 933-0202
Missouri, Independence	(816) 356-4402
New York, New York	(212) 922-1275
Texas, Dallas	(214) 239-3330
Washington, D.C.	(703) 356-5133

BEEHIVE INTERNATIONAL
4910 Amelia Earhart Drive
P.O. Box 25668, Salt Lake City, Utah 84125
ATTENTION, MARKETING DEPARTMENT

☐ I have an immediate need. Contact me
☐ Please have a salesman call
☐ Please send detailed information.

Name
Title
Company
City
State/Zip
Phone

BEEHIVE INTERNATIONAL® TOLL FREE **(800) 453-9454**

"Quality and performance you can afford"

HEADQUARTERS: 4910 Amelia Earhart Drive Box 25668 · Salt Lake City, Utah 84125 · (801) 355-6000 · TWX 910-925-5271
EUROPE: Gebouw 70, Kamer 134 · 1117 AA Schiphol · The Netherlands · Phone 020-451522 · Telex 15284

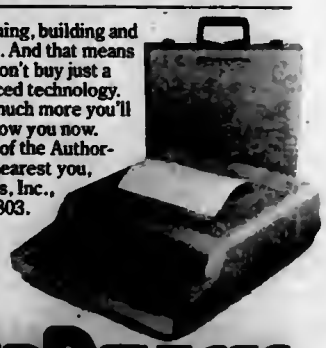
BEFORE YOU BUY A PORTABLE TERMINAL FROM TEXAS, PRETEND YOU'RE FROM MISSOURI.

SHOW ME THE DIFFERENCE.

FEATURE	MINITERM 2320	TI 785	THE DIFFERENCE
80/132 column selectability	Yes	No	Easy selection of a variety of multi-column formats for financial, statistical and business applications.
Graphic plotting option	Yes	No	Fast, high resolution graphical output for bar graphs, pie charts and other management reports wherever needed.
Six user-definable function keys	Yes	No	Allow simple, one-step connection to network and data bases; store user-friendly prompts or daily field information for later, cost-effective transmission; battery back-up memory preserves data even when power is off.
Self Help Command Mode	Yes	No	Start-up Manual is built in. Step-by-step prompting permits terminal configuration for individual applications.
Built in 300/1200 acoustic coupler	Yes	Yes	Cuts telecommunications costs; flexible access to any data base, from any telephone.
RJ-11 telephone jack option	Yes	No	Minimizes high speed communication errors and permits unattended operation for receipt of messages during non-business, off-peak hours.
Full One-Year Warranty	Yes	No	Miniterm Reliability enables CDI to offer four times the industry standard warranty; on-site, same day service—nationwide.

Computer Devices has been designing, building and servicing terminals for over a decade. And that means that when you buy a Miniterm® you don't buy just a name, you buy experience and advanced technology.

You owe it to yourself to see how much more you'll get with Miniterm. We're ready to show you now. For more information, or the number of the Authorized Computer Devices Distributor nearest you, call or write today. Computer Devices, Inc., 25 North Avenue, Burlington, MA 01803.



1-800-343-5104

In Massachusetts call (617) 273-1550

We travel in the best companies.

COMPUTERDEVICES

DG Reports Drop In Quarter Earnings

WESTBORO, Mass. — For its second quarter, Data General Corp. reported earnings of $5.6 million or 52 cents per share, down from the $13.5 million or $1.28 per share earned in the same quarter a year ago.

Revenues for the quarter rose 9% to $139.6 million, up from $128.3 million, the company said.

For the the first half of its fiscal year, the firm earned $20.5 million or $1.92 per share, compared to 1981's first-half earnings of $27.3 million or $2.57 per share. Per share earnings reflect gains from extraordinary credits, according to a company spokesman.

Revenues for the first six months were $282.3 million, compared to $253.7 million in the same year-ago period.

Effects of Recession

"The results of this fiscal period reflect the continuing effects of the recession and inflation on both the company and the computer industry as a whole," DG President Edson D. deCastro said.

DeCastro remarked that if the current level of business continues to be flat, earnings for DG's third quarter would fall below those reported in the current quarter.

Customer buying intentions are uncertain, he added.

Nickels & Dimes

Analog Devices, Inc. has announced a five-for-four stock split in the form of a 25% stock dividend.

$ $ $

Wespercorp, a California-based manufacturer of electronic equipment, has had 1,808,726 shares of common stock approved for original listing by the American Stock Exchange.

$ $ $

Mikros Systems Corp. has announced a reduction in the exercise price of its outstanding common stock purchase warrants, expiring March 3, 1983.

$ $ $

Data Switch Corp. has filed a registration statement with the Securities and Exchange Commission relating to a proposed initial public offering of its common stock. The offering is expected to include 560,000 shares being sold by the company as well as 260,000 shares being sold by certain shareholders. The initial offering price will be approximately $12 per share.

$ $ $

Rexon Business Machines Corp. has filed with the Securities Exchange Commission a proposed public offering of 565,000 common shares in an effort to raise approximately $4.5 million.

$ $ $

Anacomp, Inc. has applied to list its common stock on the New York Stock Exchange. Pending approval, Anacomp stock would begin trading on the exchange in late April.

$ $ $

Syntrex, Inc. announced its initial public offering of 1.5 million shares of common stock at $10 per share.

$ $ $

Digital Productions of Los Angeles has received guarantees for up to $5 million in bank loans from Ramtek Corp. in return for convertible debentures that, if converted, would provide Ramtek with a controlling interest in the company.

Cray Merges R&D Units

CHIPPEWA FALLS, Wis. — Cray Research, Inc. has announced that it is consolidating its research and development programs and transferring technology developed at its laboratory in Boulder, Colo., to a company facility here.

The decision is the result of the company's use of liquid-immersion technology to develop the Cray-2 computer, a company spokesman said. The company will integrate the computer development activities here with the very large-scale integration technology base that is taking place here, the spokesman said.

The company will relocate the 45 Boulder employees to another area, the spokesman said.

Report Outlines DP Marketplace

NEW CARROLLTON, Md. — Analinc Corp. has announced a 250-page report outlining the marketing opportunities in the data processing marketplace.

Called the *Association Market Analysis*, the report includes opportunities in the trade, business and professional association marketplace, the vendor spokesman said.

The report costs $1,250, Analinc said.

Analinc is located at 7611 Vicar Place, New Carrollton, Md. 20784.

CACHE-IN ON FASTER PAGING PERFORMANCE FROM INTEL.

Only Intel can offer you a paging device with twice the performance at half the price.

That's the bottom line when you compare Intel's FAST-3800 family of semiconductor disk paging devices to IBM's 3880 model 11.

Here's how you cache-in on this great deal from Intel.

Unlike the 3880 model 11, Intel's FAST-3800s typically provide 100 percent coverage of page data sets. That means you get at least twice the performance. For less cash. Because the data sets are there—not out in another disk unit—when the CPU requests them.

You can also benefit from Intel's experience with the microprocessor. (We introduced it in 1971.)

The heart of the FAST-3800s is Intel's iSBC™ 86/12 single-board computer. The microcomputer selected by many major DP manufacturers for use in their systems. It is this high-performance microcomputer which other paging devices lack, that uniquely enables the FAST-3800s to either emulate a 2305 or run in VM Native Mode.

Or to perform under DOS/VSE or MVT/VSE* operating systems.

Or function as a data base assist processor with Intel's SYSTEM 2000® data base management system.

And even emulate various direct access storage devices. This adds up to greater performance from a microprocessor-based design. Where software compatibility is no problem.

You can further profit from the FAST-3800s' dependability. The FAST-3800 semiconductor disks are self-healing to ensure the device is virtually fail-safe.

As a matter of fact, a Northeast U.S. hospital equipment manufacturer says, "The FAST-3800 has not been down for even one second since its installation on our 4341 in August, 1981." Dependability is a key part of our performance.

If a problem should arise, Intel product service offices are located in some 60 U.S., Canadian and European cities.

Why pay twice the cash for half the cache? Contact Intel's Marketing Information Office at 800/531-5304. In Texas call 512/258-5171. Or return the coupon today.

intel® delivers solutions

Name _____

Organization _____

Address _____

City/State/Zip _____ Phone (___) _____

CPU/Operating system _____

Return to Intel Marketing Information Office, P.O. Box 9968, Austin, TX 78766.

CF

*Developed by Software Pursuits, Inc.

Strauch Elected Magnuson President

SAN JOSE, Calif. — Magnuson Computer Systems, Inc. has elected Charles S. Strauch to the position of president and chief executive officer.

Strauch, who will also serve on the board of directors, most recently was the president and chief operating officer of Memorex Corp. He had announced in February that he would leave Memorex later this year.

From 1967 to 1979, Strauch held various management positions with Gould, Inc.

Strauch replaces Charles R. Cole, who has been acting as interim president and chief executive officer since the resignation of Joseph L. Hitt in January.

Cole has now replaced Paul H. Magnuson as board chairman.

Magnuson, a founder of the company, will continue as a board member.

Executive Corner

Other Moves

• Edward P. Gistaro has been elected president and chief operating officer of Datapoint Corp.

• Richard F. Cassidy has been named president of Solidstate Controls, Inc., a unit of Rochester Instrument Systems, Inc.

• Gerhard O. Angermann has been appointed president of Arms, Inc., a subsidiary of NSA, Inc.

• Patrick McGregor has been appointed president; David Rubin, vice-president of network management systems; and Jeffey Gee, vice-president of Washington, D.C., operations for the Consulting and Technical Services Division of Contel Information Systems, Inc.

• Marjorie B. Greene has been appointed vice-president and manager of Chicago operations for Pactel, Inc.

• Northern Telecom, Inc. announces the following appointments: John W. Caffry, executive vice-president of finance and administration; John A. Mahoney, vice-president of sales, digital switching systems; Wayne R. Lasson, vice-president and general manager; and Howard Garvey, Robert A. Drake and Herbert L. Huges have been named vice-presidents.

• Enjeti Murthi has been appointed vice-president of new product development for Precision Monolithics, Inc.

• John S. Potate has been named vice-president of management systems operations for Systems Development Corp's SDC Systems Group.

• Stanley A. Alenka has been promoted to vice-president of the life assurance systems unit at Informatics, Inc.'s commercial information systems operation.

• Leon G. Lesniak and Paul J. Palmer have been named vice-presidents of the Information Systems Group/National Account Division of IBM.

• Steve Cooper has been named vice-president of operations at Silicon Systems, Inc.

• Steven B. Tatum has been named vice-president of North American marketing and sales for Televideo Systems, Inc.

• Leon J. Level has been elected corporate vice-president and treasurer of Burroughs Corp.

• James E. Williams has been appointed vice-president of finance and chief financial officer of On-Line Business Systems, Inc.

• Douglas L. Rankin has been elected vice-president, West, of Information Systems Consultants, Inc.

• J. Thomas Zender has been named vice-president of marketing for Database Systems Corp.

• Louis J. Lepine has joined Sytek, Inc. as vice-president for IBM development.

• Robert L. Haapoja has been named vice-president of manufacturing at Data Systems Design, Inc.

• Robert T. Knight has joined Computer Sciences Corp. as a corporate vice-president.

• Sugu Aria has been named vice-president of finance at The Destek Group.

• Nicholas S. DeSimone has been appointed to the newly created post of vice-president of international sales at Sykes Datatronics, Inc.

• Richard F. Oliva has been promoted to the newly created position of director of product marketing at Alpha Micro, Inc.

• Cleayton J. Mills has been appointed quality assurance manager of the Large Disk Drive Division at Memorex Corp.

Dealers Form Association

WESTPORT, Conn. — An association of independent computer dealers has been formed to promote a consistent level of service and ethical standards within the industry through a nationwide network of dealer members, according to association President Seymore Merrin.

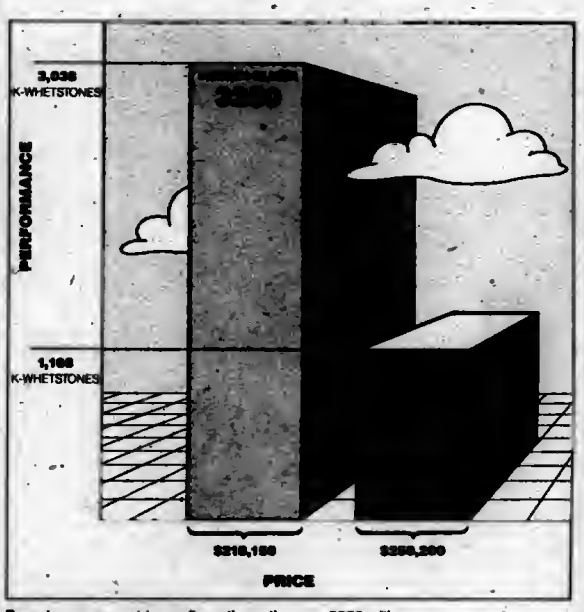
The Association of Better Computer Dealers (ABCD) will provide consumers with a knowledgeable base of full-service independent dealers who can offer computer buyers not only advice and direction, but also service and reliability, a spokesman said.

ABCD members will be required to provide fully staffed service departments and to offer customers on-site maintenance contracts guaranteeing prompt response time. Members must also establish and maintain a code of ethics that states customers will be sold the product most suited to their needs.

More information about the organization is available from ABCD, 1439 Post Road E., Liberty Plaza, Westport, Conn. 06880.

There are two leaders in 32-bit minicomputers.

We're the one with the new 3250-half the size, twice the speed for 10% less than VAX.



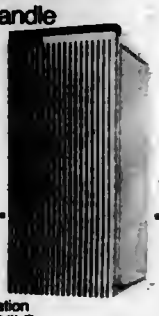
Based on comparable configurations, the new 3250 with FORTRAN VII Z delivers more performance for less money than VAX 11/780.

The new Perkin-Elmer 3250 tops the VAX 11/780 in every critical category: processing power, system capacity and throughput. At prices starting as low as $150,000 with 2MB of memory.

Example: Teamed with Perkin-Elmer's new FORTRAN VII Z—the industry's first universally optimizing compiler—the 3250 yields 3,038 single-precision K-whetstones per second. DEC's VAX 11/780, by comparison, can perform only about 1,200 per second.

Utilizing state-of-the-art 64K RAM technology, the 3250 packs up to 16MB of directly addressable memory in a single 24" wide x 56" high cabinet. DEC doesn't offer that much memory in *four* cabinets.

The 3250's dual 32-bit memory bus delivers 40MB/second I/O bandwidth and 64MB/second peak system throughput rate. It can handle up to 115 gigabytes of on-line storage and control over 1,000 I/O devices. VAX, with its single bus architecture, just can't touch these specs.



Looking for a high-performance 32-bit minicomputer? Look to Perkin-Elmer—the company with more installed 32-bit minis than any other company except one. We're the one that gives you more. More performance. More support. More value. Call or send in the coupon today for details on the new 3250. Perkin-Elmer, Oceanport, NJ 07757. Tel: 800-631-2154. In NJ 201-870-4712. **We're the one.**

The Perkin-Elmer Corporation
Marketing Communications
2 Crescent Place
Oceanport, NJ 07757

Please send me complete information on the new 3250 with FORTRAN VII Z.

Name_____ Tel_____

Title_____

Company_____

Street_____

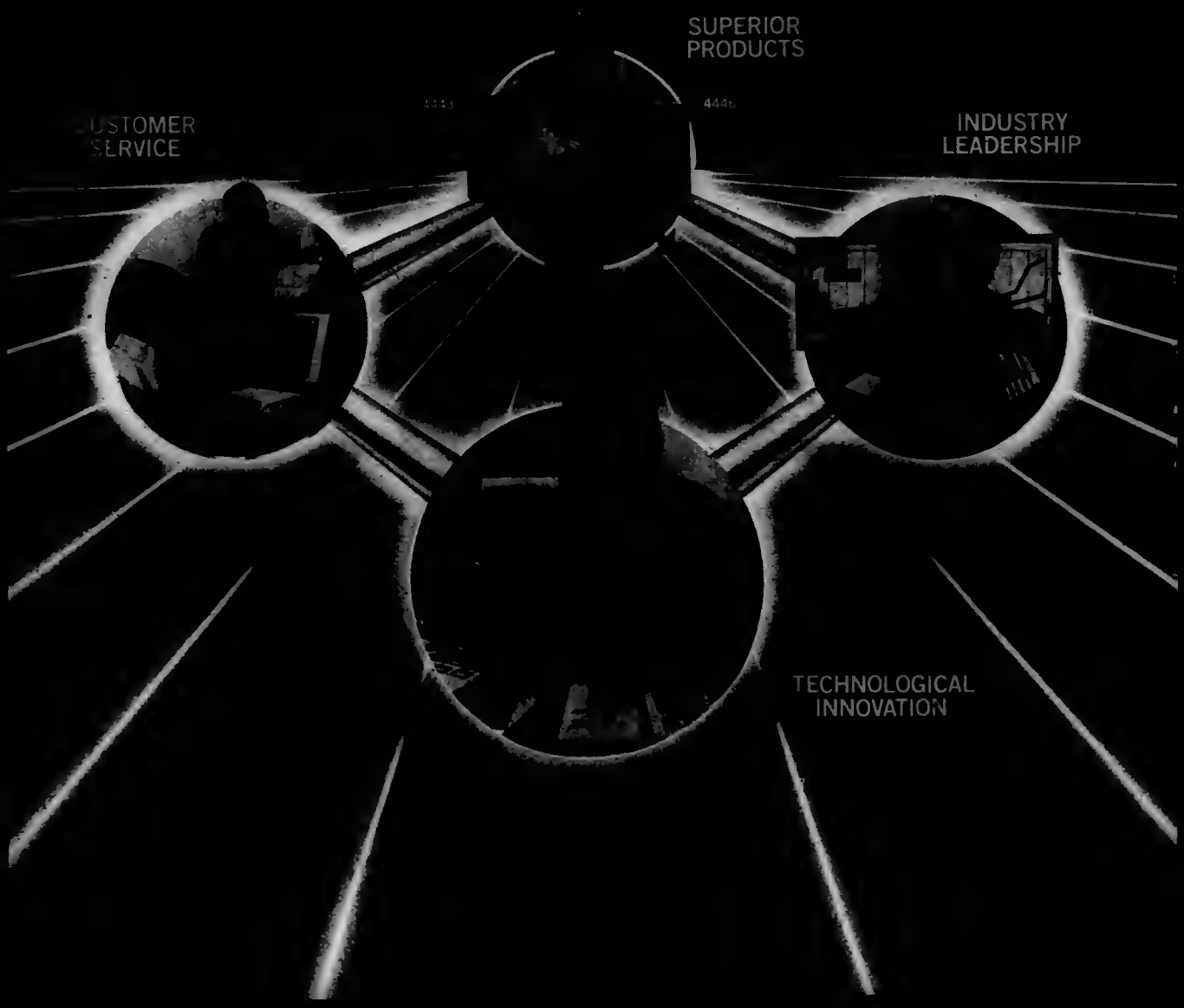
City_____ State_____ Zip_____

CW412

PERKIN-ELMER

IPL STAKES OUT THE FUTURE AS THE LEADER IN 4300-COMPATIBLE MAINFRAMES.

ipl SYSTEMS INC.



Vendor to Adapt Series/1 To Handle DG Applications

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — A small business systems supplier will soon begin offering the IBM Series/1 in a repackaged version that will reportedly run Data General Corp. applications software without recompilation.

Western Business Computers, Inc. (WBC) has arranged with IBM to buy Series/1s under the industry giant's Value-Added Remarketers program and then enhance the hardware with WBC's Liberator III operating system, which will become available during the fourth quarter.

Coupled with a proprietary compiler, Liberator III will make the IBM system compatible with DG applications programs without requiring any software conversion, according to a WBC official.

WBC then plans to resell and support the resulting turnkey systems through a nationwide dealer network that will boast some 20 outlets by mid-June and 40 to 50 by year's end, the official said.

Under the contract with IBM, WBC has reportedly agreed to purchase 1,000 Series/1 systems during the next four years. The company will reportedly receive a 40% discount on the equipment.

The Series/1-based configuration brings to three the number of turnkey systems that Western either already offers or is currently developing. In January, the company announced its Liberator I operating system, which reportedly allows application software originally written for Qantel Corp.'s small business computers to run — without reprogramming — on Honeywell Information Systems, Inc.'s DPS-6 minicomputer line.

During the fourth quarter, Western also plans to begin delivering its Liberator II operating system, which will make the same DPS-6 family software-compatible with Basic Four Corp.'s processors.

All three Liberator-based configurations illustrate Western's basic product strategy, which calls for the creation of turnkey systems that combine "name-brand" hardware with other small business systems' applications software.

By year's end, Western reportedly expects to take its product strategy one step further by expanding the repertoire of applications software that can operate with the Series/1 and the DPS-6 line. Future versions of the Liberator operating system will soon enable the IBM and Honeywell hardware to emulate small business systems from widely used vendors like Digital Equipment Corp. and Wang Laboratories, Inc., the source said.

Western also plans to expand its product line to include additional models of processors. In the IBM world, for example, the company eventually expects to offer repackaged versions of "practically every system up to the 30 series," the spokesman added.

Although Western's Series/1- and DPS-6-based configurations are aimed primarily at computing novices, the products will also be sold to seasoned users who have outgrown their existing systems and lack an avenue for expansion. The repackaged systems will give such users an otherwise unavailable upgrade path and at the same time allow them to preserve their original investment in applications software, the spokesman said.

A low-end Series/1 package containing a 128K-byte processor, 10Mbyte disk unit, one terminal and a character printer will cost less than $30,000. A high-end configuration with a 1M-byte CPU and 30 terminals will cost approximately $500,000.

New Companies

CFM Software Services is a software development and consulting firm offering programming support for business and scientific applications, development of in-house training programs and general consulting services. The firm is located at 4 Himmel Court, Coram, N.Y. 11727.

Personal Systems Technology, Inc. provides peripherals and add-in equipment for IBM's Personal Computer. It is located at 22957 LaCadena, Laguna Hills, Calif. 92653.

Via Systems, Inc. is a firm that will design, manufacture and market a single-user, turnkey, interactive graphics system for use in the design of very large-scale integrated circuits. The firm, which anticipates moving to new quarters, can be reached at P.O. Box 1249, 11 Concord St., Nashua, N.H. 03061.

High Technology Leasing Corp. is a wholly owned subsidiary of Information Management International, Inc. providing customized leasing packages for its parent firm. It is located at 1101 S. Winchester Blvd., San Jose, Calif. 95128.

Solid Software, Inc., a national supplier of software packages for the personal computer industry, has opened for business at Suite 700, Seven Piedmont Center, Atlanta, Ga. 30305.

START TO FINISH COVERAGE OF NCC

AND EVERYTHING IN BETWEEN

We start with our May 31st National Computer Conference Preview Issue. Everything you need to know about the show before it's happened. We'll include the sessions, tell you who's speaking, review the exhibitors and what they'll be exhibiting. Extra issues will be distributed at the *Computerworld* booth at NCC. Black and white ad close is May 21st. Color close is May 14th.

Then our NCC Show Issue comes out June 7th, the day of the show. It will have last-minute show information, speech previews and other show details. Pick up a copy at the *Computerworld* booth. Black and white ad close is May 27th*. Color close is May 21st.

Finally, our June 14th NCC Wrap-Up Issue will have complete coverage of all that happened, prepared by our 35-person editorial staff. You'll read who said what, who introduced what and how it works, and review the show's features and highlights in words and pictures. Black and white ad close is June 4th. Color close is May 28th.

Contact your *Computerworld* representative for complete ad details for any or all of these Special Issues. Or, to reserve ad space, call Frank Collins at (617) 879-0700.

*Note early close.

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

BOSTON/Chris Lee, Ed Mancini, Joe Pashagh, Kathy Doyle, Diane Sabey, (617) 879-0700
CHICAGO/Dave Dalber, Steve Bennett, Jim Rankin, Chris Lee, (312) 827-6683
NEW YORK/Mike Mattson, Peter Sanft, Doug Cheney, Ray Corbin, (201) 967-1550
SAN FRANCISCO/Bill Healey, Barry Milione, Ruth Gordon, Paul Lofiegio, Eileen Dunn, (415) 421-7550
LOS ANGELES/Jim Richardson, Bob Hubbard, Beverly Ross, Dallas Pendergrass, (714) 556-6400

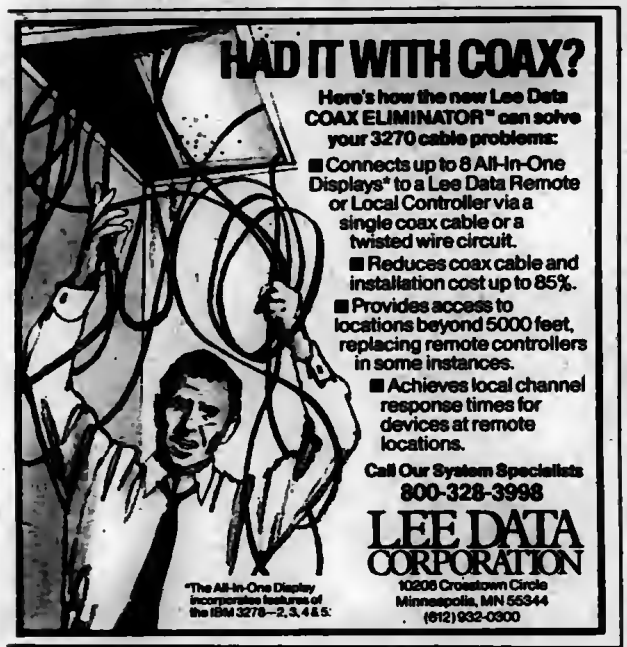
Memorex, CDC, Magnetic Peripherals Set Up Two Joint Venture Companies

SANTA CLARA, Calif. — Memorex Corp., Control Data Corp. and Magnetic Peripherals, Inc. have announced the formation of two joint venture companies — Peripheral Components, Inc. (PCI) and Disk Media, Inc. (DMI).

PCI, a joint venture of Memorex and Magnetic Peripherals, will manufacture thin-film read/write heads for magnetic disk drives.

DMI, a joint venture of Memorex and CDC, will perform the research, development and manufacture of advanced recording media for use with thin-film heads.

Magnetic Peripherals is owned principally by CDC and Honeywell, Inc. Information regarding the location, staffing and start-up schedules for the new companies will be announced at a later date.



AN OLD FASHIONED SPRING-TIME SALE!

IBM.

Personal Office Computers, Inc., offers new IBM 3101 Display Terminals at savings from $310 to $380 per unit. Immediate delivery on all orders whether one or one hundred.

LOWEST PRICES NATIONWIDE... CALL for quotes.

Call us 213-989-4086

Orders & Installations

Management Systems Division of Informatics, Inc. has signed an agreement to provide Smith Bros. Hardware Co. of Columbus, Ohio, with complete Distribution IV information management services.

Rand Information Systems, Inc. has been awarded three contracts totaling approximately $7 million from Alcan Smelters & Chemicals Ltd., McGraw Edison Co. and Standard Oil of Ohio for systems based on its Comprehensive Industry Distribution Systems.

Cray Research, Inc. will install a Cray-IS 1000 computer system at the new Digital Productions facility in Los Angeles, Calif. The system, which will be leased by Digital, is valued at $6.5 million.

National Data Corp. has been awarded a three-year, $903,291 contract to provide on-line computerized services to the U.S. Immigration and Naturalization Service.

Sperry Univac has received orders for its System 80 computer from Chemung County, N.Y.; Center Island Pennysaver Advertisers, Long Island N.Y.; Aloe Creme Laboratories, Inc., Miami, Fla.; Scarborough Building Society, Scarborough, UK; Gant's Foods, Cape Province, South Africa; The Mentone Group, Port Elizabeth, South Africa; The Building Industrial Council, Cape Town, South Africa; and the Choko Bank Ltd., Tokyo, Japan.

Foreign Orders & Installations

Concord Data Systems, Inc. (CDS) has received an order and an option from the Swedish Postal Telephone and Telegraph Authority for its 1,200 bit/sec CDS V.22 modems. The order is valued at about $2.7 million.

Cray Research, Inc. announced that the University of London is purchasing a Cray-1S/1000 computer system, valued at $7.7 million, that the university has been leasing since April 1981.

The South African Transport Services has signed a $14 million contract with Sperry Univac for the supply and installation of the South African Transport Services Data Communications Network.

Supershorts

A U.S. bankruptcy court in California has awarded Computer Communications, Inc. (CCI) a $5 million judgment from Codex Corp., a Motorola Corp. subsidiary. The judgment is the result of a wrongful termination by Codex of a joint marketing and development agreement with CCI.

— — —

International Brokerage Information Systems, Inc. and Telecom Systems Group, Inc. have agreed to a joint venture under which the companies plan to offer a range of computer- and network-based services.

— — —

Management Assistance, Inc. has obtained a permanent injunction against J&B Computer Products, Inc. prohibiting the unauthorized copying, use or modification of its proprietary operating system software known as Boss.

— — —

Business Information Products, Inc. (BIP), formerly On-Line Systems, Inc., has become a division of United Information Services, Inc., a United Telecommunications, Inc. company. BIP will be responsible for the domestic and international operations of On-Line Systems, United Computing Systems and United Computing International.

— — —

In a cooperative venture, Financial Interstate Services, Inc. (formerly United American Service Corp.) and Logica, Inc. announced the first U.S. bank-at-home demonstration using Prestel Gateway technology. Site for the demonstration will be the 1982 World's Fair in Knoxville, Tenn.

— — —

National Data Corp. has merged its Network Services Division and its recently acquired Rapidata, Inc. The new division, to be known as the Rapidata Division, will be headed by former Rapidata President Robert J. O'Brien.

— — —

General Electric Co. has completed a restructuring of its electronic component businesses in an effort to increase its participation in the integrated circuit market.

— — —

Advanced Electronics Design, Inc. has announced the reorganization of the company to provide for the formation of two divisions, one each for disk and graphics products.

— — —

In a joint statement, Computer Communications, Inc. (CCI) and Compudyne Corp. announced an agreement allowing CCI to prepare a plan of reorganization in the Chapter 11 proceedings, which were filed in November 1980. Under the proposed restructuring, it is expected that Compudyne will receive 70% of the reorganized company.

— — —

Microsoft Corp. has filed a copyright infringement suit against Advanced Logic Systems, Inc. (ALS) of Sunnyvale, Calif., alleging that ALS copied the company's copyrighted Softcard Bios and Boot code programs.

— — —

AVL, Inc. announced that its Business Systems Division, Eagle Computer, Inc., has been established as a separate subsidiary.

RATES: United States — $36. Canada, Central & South America — $110
Europe — $165. All Other Countries — $245 (Airmail Service)

(MC Only: List four digits above your name)

If charge we must have cardholder's signature _____ Expiration Date _____

First Initial	Middle Initial	Surname	
Your Title			
Company Name			
Mail To			
City		State	Zip Code

Address shown is
☐ Business
☐ Home

☐ Check here if you do not wish to receive promotional mail from *Computerworld*

☐ Check here if you're interested in receiving information on *Computerworld*'s Index

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

BUSINESS/INDUSTRY

10 Manufacturer of Computer or DP Hardware/Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/Refining
75 Business Service (except DP)
80 Education/Medicine/Law
95 Government: Federal/State/Local
90 Printing/Publishing/Other Communication Service
95 Other _____

TITLE/OCCUPATION/FUNCTION

11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/Administrative Service
22 Director/Manager/Supervisor DP/MIS Srvs
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other _____

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

[illegible] MA[illegible] 1985

Detach here, fold, and place in post-paid envelope attached through binding.

COMPUTERWORLD

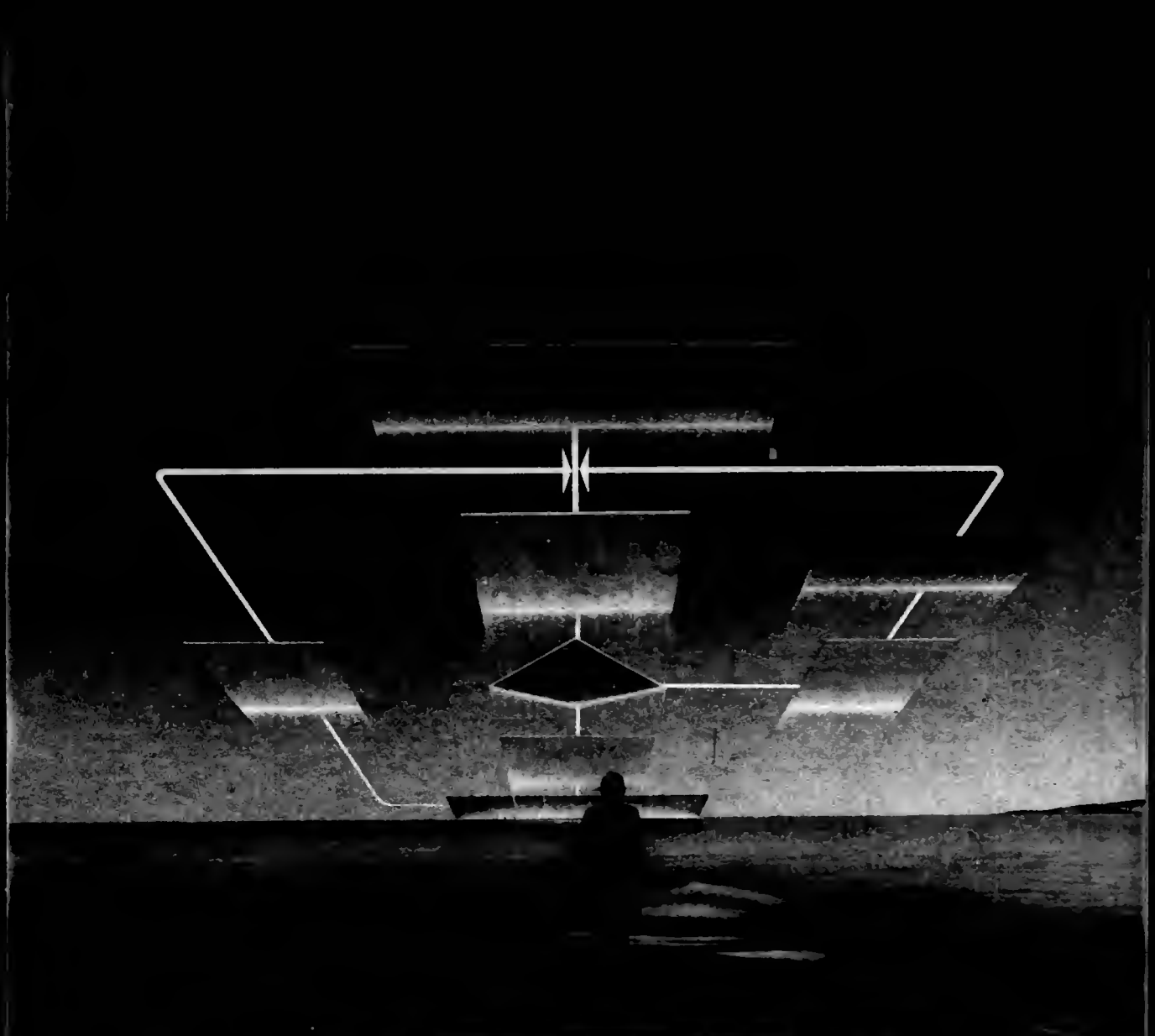
. . . the one weekly newspaper that's designed to fulfill your unique "need to know" . . . the one newspaper that can give you all the current information you need to benefit you, your organization and your career progress . . . 52 weeks of incisive news, commentary and special reports . . . subscribe today, use the attached postage paid order form.

☐ Please enter my subscription
(details on back)

☐ I'm already a subscriber, but I'd like you to change my:
address
title
industry
other

My current mailing label is attached and I've filled in new information on the other side

Put old label or label information here



Talk to Digital Educational Services.
Where the best people go to get better.

Anyone running a DP department knows the industry keeps changing so fast, it's difficult for even the best people to keep up. Yet well-trained people are your department's most valuable resource.

Digital is here to help, with one of the most complete and advanced educational services in the computer industry. We can also provide a variety of ways to learn, depending on your training needs and budget.

You can send your people to a Digital training center. We have 24 internationally, where we've invested $40 million in computers solely for training. We'll help find the right learning path from well over 300 lecture/lab courses. All are taught by experts who know computer technology and the best ways to teach it.

We'll set up programs so your people can study on their own, if you prefer—offering versatile, flexible self-paced print, audio/visual and computer-based instruction formats.

© 1981, Digital Equipment Corporation

We can also conduct on-site management and technical seminars, on topics ranging from software engineering to corporate DP strategies.

No matter how your people learn from Digital, you can be sure they'll get a practical high-quality education. Because the programs they'll take are the same programs we use to train Digital's own computer professionals.

Learn how we can make your best people even better. Write to: Digital Equipment Corporation, Dept. BU/E33, 12 Crosby Drive, Bedford, MA 01730. In Europe: Dept. HB, 12 av. des Morgines, 1213 Petit-Lancy/Geneva. In Canada: Digital Equipment of Canada, Ltd.

digital

We change the way the world thinks.

MRP Software Vendors Urged to Talk Business

By Marcia Blumenthal
CW Staff

SCOTTSDALE, Ariz.— Although producers of manufacturing software hold one of the keys to the survival of U.S. industry, these vendors have to learn to talk the language of manufacturers before their products will be accepted, according to a leading consultant.

Unless developers of manufacturing resource planning (MRP) systems stop slinging around fancy acronyms and start creating systems based upon standard manufacturing terminology and practices, they will be viewed as computer tinkerers by executives at manufacturing companies, charged Oliver W. Wight, president of Oliver Wight, Inc.

MRP systems are now attaining maturity, going beyond parts planning and job schedule functions, Wight told a group gathered here recently for an executive conference sponsored by Internatonal Computer Programs, Inc. These systems now tie these functions with corporate financial systems. However, MRP systems have a long way to go before they can be viewed as a powerful weapon to counter the threat from Japanese manufacturing companies, Wight charged.

Developers of MRP systems are developing "people systems, not computer sytems," he observed. Because of tha human interface requirement, these systems must be simple. "Until you can eliminate human intervention [in the manufacturing process], you must keep the product simple," he said.

While systems developers must sell top executives on the benefits of MRP systems, they must also understand what goes on in a production shop and communicate the value of the product to employees on the shop floor. Production people are not looking for an "automated shop optimizer," they are looking for a benefit. "If you talk down to these people, your system will bomb," he charged.

CW Photo by M. Blumenthal
Oliver W. Wight

Besides gaining credibility with potential users of what Wight termed second-generation MRP products, vendors must avoid the "sunrise/sunset" syndrome of these systems. In the past, when vendors have introduced a product that catches on, they sold a lot of products, but were unable to keep up with the demand for technical modifications and support.

MODEM DESIGN ECONOMY GETS DOWN TO EARTH WITH THE UDS 212 LP

If you're considering 212As for 1200 bps communication only, UDS has a down-to-earth design solution that will save you money! It's the 212 LP, a low-priced, line-powered modem that's 212A-compatible for full-duplex, 1200 bps asynchronous communication. If you don't need the 300 bps channel, you don't pay for it.

$495 (quantity one)

No AC connection is required, since operating power comes directly from the telco line. The unit is FCC certified for direct connection to the DDD network and it fits under your telephone handset.

For down-to-earth modem buyers, the message is simple: you can cut system cost by buying only 1200 bps capability when that's all you need.

For full technical details and quantity discounts, ask Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805-1983. Phone 205/837-8100; TWX 810-726-2100.

"Confidence in Communications"

Universal Data Systems

DISTRICT OFFICES: Summit, NJ, 201/522-0025 • Blue Bell, PA, 215/643-2336 • Atlanta, 404/986-2716 • Chicago, [illegible] Dallas, 214/385-0425 • Englewood, CO, 303/694-6043 • Houston, 713/488-4599 • Santa Ana, 714/972-4616 • Sunnyvale, [illegible]

Contracts & Pacts

Bob White Computing & Software, Inc. has been awarded federal government contracts to provide the Social Security Administration with an on-line "debt management" computer system to aid the government in its on-going program to recover Social Security benefit overpayments.

Stratus Computer and Ing. C. Olivetti & C., S.p.A. Ivrea (Italy) announced a $40 million agreement granting Olivetti exclusive marketing rights for selected countries in Europe, South America and Africa.

Data General Corp. of Westboro, Mass., and Standard Microsystems Corp. of Hauppauge, N.Y., have signed a nonexclusive, worldwide patent/technology licensing agreement that will enable DG to make, to use and to sell high-speed, high-density, very large-scale integrated circuits, which will be manufactured through Standard Microsystems' recently announced titanium-disilicide gate technology.

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

Introducing a New, Low-Cost Way to Sell Hardware and Software in Computerworld The Computerworld Bulletin Board

What is The Bulletin Board?

It's a new classified section of *Computerworld*, designed especially for the selling and buying of individual pieces of hardware and software in a convenient, low-cost format. It is especially suited to companies that have a piece of used equipment they want to sell. For one low price, you can inform more than half a million *Computerworld* readers around the country of your equipment's availability.

How Does The Bulletin Board Work?

Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Software") and within headings, if necessary, by type of equipment. The first line of the ad is set in larger, bold type, and should be the standard equipment identification (such as "IBM S370/Mod 40"). (Headlines may be put on more than one line, if desired.) The body copy should describe the equipment very briefly, give the price and the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

Price for each standard unit is only $99. (One unit minimum, and no fractional units available.) Anyone can place an ad, but no agency commissions are paid, no quantity discounts allowed, and no credit toward rate is given for contract advertisers who advertise in other sections of *Computerworld*. It's a simple and effective system for buying and selling hardware and software.

How to Place an ad in The Bulletin Board.

Ads are accepted in the mail, over the telecopier or by phone. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it, using no more than 12 characters (including spaces) per line in the body copy using our standard no more than 28 characters (about 5 words) per line for headlines, and typefaces. (A standard unit can take up to 12 lines of body copy.)

Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classified section under the heading "The Bulletin Board." We assume no liability for errors beyond the price of the ad in the case of material errors.

Here's the Address and Phone.

Bulletin Board
Classified Advertising
Computerworld
Box 880
Framingham, MA 01701
Toll-free (800) 343-6474 (In Mass., call 617-879-0700.)

See this week's Bulletin Board on Page 105.

CW COMMUNICATIONS/INC.
375 Cochituate Road, Box 880, Framingham, MA 01701
(617) 879-0700

Published by CW Communications Inc, the world's leading publisher of computer-related newspapers and magazines.

POSITION ANNOUNCEMENTS

Hampton, Va., is proving to be one of the top project sites for PRC anywhere in the U.S.

In the midst of one of the most beautiful recreational environments in the east, PRC software professionals have already racked up one of the company's most dynamic growth records of the past year.

Key program areas include (but are definitely not limited to) message handling systems and advanced database development. The search is on here for database (DBMS) specialists, senior systems analysts, systems programmers and programmer analysts with solid working credentials in one or more of the following:

ADABAS, IMS, IDMS, COBOL, IBM, JCL, JES 2, ALC, ASSEMBLY LANGUAGE (MACRO-11), HYPERchannel, PDP-11, DBMS-11, SARR (PDSC, NMIC, NIDS, CMOSS, EUCOM AIDES experience desirable.)

U.S. citizenship required. PRC offers a moving allowance to the Hampton area, fully competitive salaries and benefits. Please send your resume in confidence, or call Ella Reischer at (703) 556-2228.

prc

Planning Research Corporation

1500 Planning Research Drive, McLean, Virginia 22102

An Equal Opportunity Employer

PROGRAMMER/ ANALYST

Cordero Mining Company, a subsidiary of Sun Company, is seeking a Programmer/Analyst for a surface coal mine in Gillette, Wyoming. Responsibilities include maintaining current programs, implementing new systems and maintaining systems software for an on-site Data General minicomputer.

Requirements include knowledge of COBOL, IBM/OS/JCL and structured techniques.

We offer an excellent salary, benefits and relocation package. If interested, send resume including salary history to: **The Employee Relations Department, CORDERO MINING COMPANY, P.O. Box 1449, Gillette, Wyoming 82716. Or, call 307-682-8005. We are An Equal Opportunity Employer, M/F.**

CORDERO

Account Executive

GOULD

Computer Industry

Gould Inc., S.E.L. Computer Systems Division, an international leader in the manufacture of sophisticated super minicomputers for high-performance real-time applications, took another step forward by introducing a three-board 32-bit computer called QUADRABYTE. We are pursuing 3 Account Executives to exclusively handle QUADRABYTE in the Eastern, Central and Western regions.

The ideal candidate has a technical degree or equivalent and 5 years experience as well as a proven record of success selling computers to the engineering-oriented OEM market.

Along with a fast track for promotion and advancement, we're offering excellent salaries and comprehensive benefits. For immediate and confidential consideration please call Brad Matters at (305) 587-2900 or send your resume, including salary history and requirements, to GOULD INC., S.E.L. Computer Systems Division, Dept. CW412, 6901 W. Sunrise Blvd., Ft. Lauderdale, FL 33313. An Equal Opportunity Employer. M/F/H.

Electronics & Electrical Products

SYSTEMS

DATABASE ANALYST FORTUNE 200 NYC/NJ

Excellent opply available for the EDP Pro with 3+ yrs database administration background. Must be proficient in designing databases in an IMS/DOS or DMS/DOS metaletion. Working knwidge and hands-on exp with database utilities and modeling is essential. Company is relocating from midtown to new corporate headquarters in New Jersey, in September 1982. Relocation pckge avail if not a N.J. resident or tax and commutation assistance if you currently reside in N.J. Superior company benefits.

$30,000 FEE PAID.

INGHRAM HAMLIN
dba ROBERT THOMAS ASSOC.
555 Fifth Avenue
New York, N.Y. 10036
212-221-0600 (agency)

PROGRAMMER ANALYST/ JES 3 CONSOLE OPERATORS

Due to our rapid expansion in our Data Processing facility, opportunities are available for experienced Programmer Analysts and JES 3 Console Operators.

PROGRAMMER ANALYST

We are interested in talking with aggressive, career minded people who have at least 2-years of COBOL experience on IBM hardware. Applicants should have a demonstrated ability to develop, maintain, test, debug, document and implement applications of major complexity.

CONSOLE OPERATOR

Must have at least 2 years of JES 3 Console experience with a working knowledge of IPL procedures and skills in diagnosing systems performance and channel usage.

Our state-of-the-art facility includes dual IBM 3033, OS, MVS, IMS, CICS, and JES 3. If you meet the qualifications and have the ability to communicate well with peers, users, and management people, I would be interested in talking with you. Our salaries are very competitive along with outstanding benefits and relocation packages. Interested and qualified candidates please send resume in strict confidence to: **Jeff Russell, Technical Recruiter, 155 E. Broad Street, Third Floor, Human Resources Department, Columbus, Ohio 43265, (614) 463-8523.**

BancOhio
National Bank

An Equal Opportunity Employer, M/F/H/V

CHICAGO

Programmer Analyst, Systems Analyst, Project Leaders

Fantastic opportunity to work with Fortune 100 Manufacturing Company in Loop. 2+ years of IMS-Cobol will get you in the door. All new development. For more information, contact:

George Thomas - Manager
Thomas Kent

Dunhill
OF CHARLOTTE, INC.
520 N. Michigan Ave.,
Suite 2000
Chicago, IL 60601
(312) 341-0000

DENVER COLORADO PROGRAMMER/ANALYST

Colorado's Caterpillar dealership is seeking a Programmer/Analyst experienced with Burroughs medium system hardware and developing COBOL programs in accounting applications. If you have had at least 2 years experience in the above this is an excellent opportunity to move your career to Colorado. We offer a competitive salary and outstanding benefits. If you are interested in joining a professional data processing team which will be developing and implementing many new systems in 1982, mail your resume (with salary requirements) in confidence to:

Personnel Manager
Wagner Equipment Co.
P.O. Box 5166, Denver, CO 80217

Equal Opportunity Employer M/F

1982
Computer
Salary
Survey

[illegible] in our [illegible] is FREE!

[illegible] the computer professionals.

The new 1982 Computer Salary Survey and Career Planning Guide is available to you [illegible] charge. It's compiled and published [illegible] by Source Edp, who [illegible] more than [illegible] every year and represents 40,000 client organizations.

You owe it to yourself to review a copy of this report. Since 1968, this annual Survey has helped hundreds of thousands of computer professionals realize their career and salary potentials.

Call today, and this free Survey will be sent to you in strict confidence, without obligation.

source edp

North America's largest, non-franchised recruiting firm devoted exclusively to the computer profession.

Call today for your FREE report.

This 28-page report will show you how your salary stacks up. Please call the Source Edp office nearest you for your free copy today. If unable to call, please write:
Source Edp, Dept CS-8
Two Northfield Plaza,
Suite 227
Northfield, Illinois 60093

United States:	
Arizona	
Phoenix	602/258-9333
California	
San Francisco	415/434-2410
Mountain View	415/969-4910
Los Angeles	213/386-5500
Van Nuys	213/781-4800
Torrance	213/540-7500
Century City	213/203-8111
Irvine	714/833-1730
San Diego	714/231-1900
Colorado	
Denver	303/571-4450
Englewood	303/773-3700
Connecticut	
Hartford	203/522-4560
Stratford	203/375-7240
District of Columbia	
Washington	202/466-5690
Florida	
Miami	305/624-3538
Ft Lauderdale	305/491-0145
Georgia	
Atlanta	
Northeast	404/325-8370
Downtown	404/589-9350
North	404/953-0200
Illinois	
Chicago	312/782-0857
Northfield	312/441-5200
Oak Brook	312/986-0422
Rolling Meadows	312/392-0244
Indiana	
Indianapolis	317/631-2900
Kansas	
Overland Park	913/888-8885
Kentucky	
Louisville	502/581-9800
Louisiana	
New Orleans	504/561-8000
Maryland	
Baltimore	301/727-4050
Rockville	301/258-8800
Towson	301/321-7044
Massachusetts	
Boston	617/482-7613
Burlington	617/273-5180
Wellesley	617/237-3120
Michigan	
Detroit	313/259-7807
Southfield	313/352-6520
Minnesota	
Minneapolis	
West	612/544-3800
Downtown	612/332-8460
St. Paul	612/227-6100
Missouri	
St Louis	314/231-4680
Clayton	314/862-3600
Kansas City	816/474-3393
New Hampshire	
Nashua	603/880-4047
New Jersey	
Cherry Hill	609/482-2600
Edison	201/494-2600
Morristown	201/267-3222
Paramus	201/845-3900
New York	
New York City	
Penn Station	212/736-7445
Wall Street	212/962-6000
Grand Central	212/557-8611
Syosset L.I.	516/364-0900
White Plains	914/683-8300
Rochester	716/263-2670
Ohio	
Akron	216/535-1150
Cincinnati	513/769-5080
Cleveland	216/771-2070
Columbus	614/224-0888
Dayton	513/461-4660
Oklahoma	
Tulsa	918/599-7700
Oregon	
Portland	503/223-6160
Pennsylvania	
Philadelphia	215/665-1717
King of Prussia	215/265-7250
Pittsburgh	412/261-6540
Wilkins Township	412/247-4400
Texas	
Dallas	
North	214/387-1600
Central	214/748-1600
Fort Worth	817/339-6300
Houston	
S.W. Freeway	713/626-8705
Downtown	713/751-0100
N. Loop West	713/957-5555
San Antonio	512/344-0217
Virginia	
McLean	703/760-6610
Washington	
Bellevue	206/454-8400
Wisconsin	
Milwaukee	414/277-0345
Canada	
Toronto	416/865-1125
Don Mills	416/425-5730
Montreal	514/845-7045

position announcements | position announcements | position announcements | position announcements | position announcements

For Data Processing Professionals

There's a natural high that Beckman people enjoy, knowing their work benefits millions. Because, at Beckman Instruments, we design and produce vital clinical, process and scientific instrumentation to improve the quality of life.

As a data processing professional, you'll have the opportunity to contribute to this important effort, while working with leading-edge technology in a stimulating environment. You'll also discover excellent growth and learning opportunities, with an emphasis on training and internal promotion, compensation and benefits that are top-notch, plus comfortable surroundings in one of our Orange County facilities.

DP careers open at Beckman include:

Microprocessor Programmers
— Scientific & clinical applications —

Systems Programmers
— IBM Mainframes & subsystems —

Sr. Programmer Analysts & Sr. Systems Analysts
— Variety of financial and manufacturing systems on IBM 3033 & HP 3000 —

Timesharing Applications Programmers
— On DEC 20's —

Look into Beckman's natural high. Into how your talents can make an impact. Send your resume to: Anne Goldman, Dept. CW, BECKMAN INSTRUMENTS, INC., 2500 N. Harbor Blvd., Fullerton, CA 92634. Equal Opportunity Employer.

BECKMAN®

SYSTEMS ENGINEER

The Goodyear Tire & Rubber Company has an opening for an experienced Systems Engineer to work on the development of laboratory systems using mini/micro computers. This includes design and development of instrument interfaces, real time data acquisition and analysis software, and operating systems interfacing.

Qualifications should include at least a B.S. degree in either engineering science or mechanics, mechanical engineering or electrical engineering, and experience with programming in Fortran and Assembler. Desired experience includes digital circuit design, 8080/8085/8086 Assembly language, and DEC-11 operating systems.

Send detailed resume and salary requirements in confidence to:

K.A. Easterling

THE GOODYEAR TIRE & RUBBER COMPANY

1144 E. Market Street, Akron, Ohio 44316

GOODYEAR

SYSTEM 2000
Chesapeake Bay Area

JUST 60 MILES FROM WASHINGTON, D.C. IN A RURAL, BAYSIDE SETTING.

You've been waiting for the right time to make your next big career move. NOW is the time! ManTech keeps growing and growing. Opportunity is yours for the asking. Just give us a call. We're sure we can convince you that this is the opportunity you've been waiting for. Don't wait to polish your resume. CALL US TODAY!

We are offering highly competitive salaries in order to attract exceptionally competent System 2000 Data Base Systems Analysts and Programmers. You will be developing large-scale material, maintenance, and supply management systems for use on IBM 370/168 and IBM 3033 mainframes.

Positions are open at mid to top levels, minimally requiring at least three years application development experience with two years of extensive System 2000 involvement.

We're anxious to get you started. Call (collect) Bob Gibson or Barry Munson (301) 862-2200, or if you prefer, send resume to:

MANTECH
INTERNATIONAL CORPORATION
17 Shangri La Drive
Suite 200
Lexington Park, MD 20653
An Equal Opportunity Employer, M/F/H/V

management **mantech** technology
INTERNATIONAL CORP.

"WE PROMOTE COMPUTER PEOPLE"

INTERVIEW & HIRING COSTS (INCL. RELO.) PAID BY COMPANIES

TOLL FREE
[redacted]

Exeter Associates
NATIONAL RECRUITING CONSULTANTS
COMPUTER PARK P.O. BOX 623
HAMPTON, NEW HAMPSHIRE 03842
(603) 926-6712
A DIVISION OF EXETER INTERNATIONAL, INC.

Programmers & Analysts
Atlanta

National Data Corporation is a rapidly growing $125 million-plus, Atlanta-based company that is one of the nation's leading independent third party computer service organizations.

We are currently seeking several select data processing professionals for our conversion team responsible for developing and implementing a large, modular, data base oriented system on UNIVAC 1100 computers. It represents the conversion to new hardware of one of the largest real time data collection and retrieval systems in the world. This project offers excellent personal and professional growth opportunities for the data processing professional. Current openings include:

- **SYSTEMS ANALYSTS** - 2 years recent experience in COBOL and/or MASM on UNIVAC 1100 required, HV-TIP and DMS-1100, a plus.
- **PROGRAMMER ANALYSTS** - Minimum 2 years applications experience on UNIVAC 1100 covering real time, demand and batch environments. COBOL required, DMS and TIP a plus.
- **DATA BASE ANALYST** - 2 years recent COBOL experience with working knowledge of DMS-1100 internals in high volume transaction processing environment, and design experience with a complex data base. Conversion experience not required, but is a definite plus.

Join our team of professionals in Atlanta. NDC offers competitive salaries and excellent benefits. For immediate consideration, send resume to:

NDC **National Data Corporation**
Helen C. Sessions
One National Data Plaza
Corporate Square
Atlanta, GA 30329

Equal Opportunity Employer M/F

Give us your resume.

We'll give YOU San Francisco!

Some people come to sail on the Bay, some to ski in the Sierras, and some to snorkle in Santa Cruz. But the professional climate is the real reason, and every bit as exciting.

There's nobody better qualified than CRG to introduce you to San Francisco. We've been here longer—over 10 years—know everyone in EDP worth knowing, and our list of client companies reads like the Who's Who of the business world.

Send your resume today, or call. All fees, interview, and relocation expenses are paid by our clients.

Computer Resources Group, Inc.
333 Sacramento St., San Francisco, CA 94111
(415) 398-3535 or 3533 Bowers Ave., Santa Clara, CA 95051,
(408) 727-1440

CRG AFFILIATES IN 27 MAJOR U.S. CITIES — National Computer Associates

An employer-retained professional placement service

CHIEF INFORMATION SYSTEMS OFFICER

A dynamic, rapidly growing, two hospital Health Center with over 700 beds needs a professional to install a State-of-the-Art Health Care Information System. The Health Center, located in the Great Lakes Region, is within a Corporate structure. This is an opportunity for a person to have a major impact on the organization and to participate at the administrative level.

Applicants must have direct experience in information systems in a Health Care Environment or information systems consulting experience to the Health Care Industry. The individual must be concerned with planning and implementing state-of-the-art data based management systems for Health Care. The person will plan for the integration of patient care modules with administrative modules.

Salary commensurate with experience and comprehensive benefits package.

If you have an interest, please send a resume, including salary history, to:

Reply to CW-A3229
Computerworld
Box 880
Framingham, MA 01701

PHILADELPHIA
SR SYSTEMS ANALYST TO 32K

Central PA FORTUNE 500 co seeks indiv w/NCR VRX oper sys exp. Reqs bsbg bdcm/sfware perf eval, COBOL, MEAT 3 & tel. appls. Co has NCR V8570. Seek aggressive self-starter. SUPERB BENEFITS. Pd rels.

Contact: Regina Hardaman

ROBERT HALF
OF PHILADELPHIA, INC.
2000 Market St., Suite 700
Philadelphia, PA 19103
(215) 568-4580

SUNBELT
DATA PROCESSING CAREERS

Career for experienced professional MIS executives,managers ,systems and programming,and EDP audit individuals. All contacts will be held in strictest confidence. Please send resume or call:

Jim Bryant
RECRUITERS,INC.
11 West Oxmoor Rd.
Ste.506
Birmingham,Al 35209
205-942-5407

RECESSION? DEPRESSION?

Feeling the economic crunch? Why not let Executive Recruiters find that right job for you. Excellent opportunities exist for experienced programmers/analysts, systems programmers and field service engineers in the Washington, D.C. area. Salary to $35K. (All fees assumed by client companies). Call or send resume in confidence to: Jackie Harper

Executive Recruiters
6867 Elm Street
McLean, VA 22101
(703) 556-9580

PROGRAMMER ANALYST

Excellent growth potential within expanding insurance firm located between Baltimore and Washington. Requires experience in Cobol, IBM main frame, and on-line systems. Exposure to PMS and control software/data base systems a plus. Superior working conditions with excellent salary and benefits. Send resume to:

RICK SAUER
MONTGOMERY MUTUAL INS. CO.
17810 Meeting House Rd.
Sandy Spring, MD 20860
PRINCIPALS ONLY
EOE

position announcements | position announcements | position announcements | position announcements | position announcements

Join The Home Federal DP SURGE! Work With HOGAN Software!

SENIOR PROGRAMMER/ANALYST

Home Federal Savings is a $5 billion association whose impressive growth has generated a surge of activity for talented computer professionals. We are seeking Senior Programmer/Analysts to help develop Hogan's innovative software packages.

In this position, you will be involved with Systems Analysis, Advanced Programming and will provide Project Management for systems maintenance. You will also redesign mid-size systems and provide directions for Programmer/Analysts.

To qualify for this position, you must have 5 years programming and analysis experience and at least 1 year of experience with Hogan software. You also must have experience with Cobol, JCL, systems maintenance and have project management training.

In return for your expertise, you'll receive fine compensation and enjoy plenty of opportunity for professional growth. And, you can take advantage of San Diego's warm, sunny climate and excellent recreational and cultural opportunities. To learn more about the Home Federal DP Surge and what it can do for your career, send your resume and salary history to: **Cesar Namba, 701 Broadway, 8th Floor, Dept. CW412, San Diego, CA 92101.**

HOME FEDERAL SAVINGS and Loan Association

AN EQUAL OPPORTUNITY EMPLOYER M/F

DATA PROCESSING MVS - IMS NETWORKING

Sacramento home office of a major insurance company has career opportunities related to ambitious plans for 1982, which include

- Satellite Networking & Teleconferencing
- IMS expansion - new & conversion
- MVS-System Product Installation
- Three shared CPU complex

SYSTEMS PROGRAMMER - IMS

- Experience in MVS-IMS-SMP-TSO
- Responsible for IMS gen/tune
- MVS systems activities

DATA SYSTEMS ANALYST

- Experience in IMS utilities
- DBD & PSB gens
- Data Base Backup & Recovery
- Data Dictionary experience

PROGRAMMER/ANALYSTS

- Online/Batch Insurance Applications
- Cobol and Assembler Language
- TSO/SPF development tools

COMPUTER OPERATORS

- 2-3 years experience
- Large IBM mainframes
- All shifts

Superb climate. Ideally located for year round recreational activities. Complete benefit package, including profit sharing plan.

Send confidential resume to personnel dept. PO Box 959, Sacramento, Calif. 95804 - Telephone (916) 449-6370

CAL WESTERN LIFE®
An American General Company
M/F EOE

PROJECT MANAGERS ANALYSTS/PROGRAMMERS

Opportunities are available for professionals in systems analysis, design and implementation of information management systems utilizing:

- TRANSACTION PROCESSORS
- DATABASE MANAGEMENT SYSTEMS
- QUERY LANGUAGES
- COBOL, SPL

Qualified individuals should have a minimum of 3 years relevant experience and a college degree. HP-3000 experience preferred but not required. Excellent benefits, free parking. U.S. Citizenship required. Please submit resume to:

POLARIS INC.
1400 Wilson Blvd., Ste. 1100
Arlington, VA 22209
(703) 527-7342

EOE

Software Development

At Wang, people are our greatest asset.

The success of our business depends on inspiration, careful thought and hard work. So we recognize our people as our greatest asset. With over a billion dollars in revenues, Wang has never lost sight of the importance of our people in helping us achieve and maintain our leadership position in the field of office automation. And it's great to work where you're valued.

Put yourself in the best possible position with the industry leader.

Operating Systems

Systems Programmers and Software Engineers are needed for: Architectural Specifications, Virtual Memory Management, Process Structuring, Indexed File Systems, User and Operator Interfaces. Products currently in development include integrated office systems that combine word processing and interactive data processing and a complete, highly visible spooling system. Intelligent clustered device support and advanced job stream control systems are being planned.

Business Graphics

Systems Software Engineers are needed for the development of integrated business graphics packages allowing added user flexibility for creating documents that include text, images, plots and equations, flow charting and scientific and chemical equation support.

Data Base Development

Senior Software Engineers to join our efforts in developing advanced data base tools in two high visibility areas. As part of our query run time development team, you will integrate relational technology with Wang's "user-friendly" distributed office systems, and support new forms of human interfaces. Already under development are relational query language, recovery subsystems and a high performance file system. Requires an advsneed degree in Computer Science, related discipline, or equivalent experience, and a proven record in data base research or development. Experience in query optimization or human interfaces would be highly relevant.

Leading the way in benefits.

Our continued growth and success allow us to offer one of the best benefit programs in the industry including profit sharing, stock plans, company paid dental, medical and life insurance, tuition reimbursement, and more.

Contact us today.

Send your resume and salary history to Ellen Wyman, Personnel Representative, Wang Laboratories, Inc., CW-412, One Industrial Avenue, Lowell, MA 01851.

We are an affirmative action employer.

WANG

The Office Automation Computer Company

FLORIDA SYSTEMS PROGRAMMERS

Great Orlando Opportunity!

Expanding subsidiary of International Conglomerate has urgent need for degreed software developers. You must have prior working knowledge in creating, designing, and developing Data Base structures. Experience with DBMS a plus! Company involved in extensive software development and seeks aggressive, high-energy individuals who want fast upward growth. Fringes include superior benefits, relocation package and fees paid. Salary to $35,000

HALF

Check Mail

ROBERT HALF OF MIAMI, INC.
3655 Le Jeune Road, Ste 614
Coral Gables, FL 33134
(305)447-1787

Hardware Field Engineers

Join our rapidly growing computer service company. We offer unlimited opportunity to those with initiative and ability. Systec provides a full benefit package, top salaries, and participation in Systec's future.

SPECTRA 70 Opportunity for field engineers with Spectra 35/45 experience - US and overseas locations available. We also need IBM 360/370, 303X engineers.

If you are ready for a company where your abilities and contributions will be recognized and rewarded call today. At Systec you are not just a part of the company...YOU ARE THE COMPANY.

Phone: 800-327-2202 In Fla -305/323-8630

SysTec

2715 Navigator Ave.
P.O. Box 3015
Sanford, Florida 32771

Equal Opportunity Employer m/f

position announcements | position announcements | position announcements | position announcements | position announcements

Somewhere Special In Maine

Enjoy the good life of Maine in a highly rewarding professional environment with a rapidly expanding shipbuilding company. Due to expansion and new applications in the Systems area, we are seeking experienced personnel. Multiple IBM 4341, DOS/VSE, on-line data base technology and an interesting variety of applications offer the right individuals outstanding opportunities for professional growth.

SYSTEMS ANALYSTS

We need highly motivated individuals, preferably with a BS degree and with a minimum 2 years experience in the business community. If you communicate well, have DBMS education and have on-line or distributive processing experience, you may be the person we need. Experience in any of the following areas would be beneficial:

- DOD Cost/Schedule Control Systems
- Configuration Management
- Integrated Logistic Support
- Inventory/Production Control
- Accounting

TECHNICAL SUPPORT SPECIALIST

The successful candidate will be responsible for planning conversions to, and implementation of new subsystems and configuring hardware and software. We prefer an individual with good supervisory skills who has 3-5 years of experience with some combination of:

- MVS JES3 and TSO
- CICS and VTAM
- IMS and DICTIONARY

APPLICATION PROGRAMMERS

Requirement exists for Junior or Senior personnel preferably with 3-5 years experience with some combination of:

- COBOL VSAM
- PL/I
- CICS DMS

We offer an excellent salary complemented by an outstanding benefit package. Please forward resume with salary history in complete confidence, to D.J. McKissock, Personnel Department.

BIW

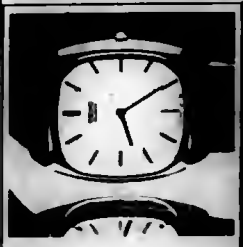
BATH IRON WORKS CORPORATION

SHIPBUILDERS AND ENGINEERS

A CONGOLEUM CORPORATION

700 Washington St., Bath, Maine 04530

An Equal Opportunity Employer M/F



Don't let time run out.

Whether you are a successful professional looking for career change and growth, or a corporate executive looking for the right data processing, accounting, financial or banking professional, you meet with success when you meet us at ROMAC.

Meet with Success.

ROMAC.

Romac & Associates
Personnel Consultants

ARLINGTON, VA
1600 Wilson Blvd.
(703) 525-5100

ATLANTA, GA
2340 Peachtree Rd.
NE (404) 231-2525

BOSTON, MA
125 High St.
(617) 482-0515

BUFFALO, NY
60 Lafayette Blvd
(716) 853-6300

CRANSTON, RI
1150 New London Av
(401) 463-7800

DAYTON, OH
111 W. First St.
(513) 461-1373

FAIRFIELD, CT
140 Sherman St.
(203) 255-0140

HARTFORD, CT
One Financial Plz
(203) 525-6037

NEWTON, MA
One Newton Exec. Plz
(617) 969-4010

PARAMUS, NJ
8-16, Rt 17
(201) 845-7000

PHILADELPHIA, PA
1700 Market St.
(215) 665-0510

PORTLAND, ME
477 Congress St.
(207) 772-6746

ROCHESTER, NY
1 Marine Midland Plz
(716) 232-4010

STAMFORD, CT
6 Landmark Sq.
(203) 323-7814

TAMPA, FL
315 E. Madison St.
(813) 228-0327

STASIS

It happens to all of us —

If it's happening to you, it's time to explore a possible metathesis. For over 15 years in the San Francisco Bay Area, professional, quality Data Processing placement has been our only *raison d'être*. All of us came from DP, our clients have confidence in our expertise and ability. Current situations exist for quality people in:

- EDP Audit
- OS/Systems Programming
- RPG III Analysis
- PL/1 Programming
- Inventory Control Consulting
- IMS Design/DBA

Jerry Anderson/Bob Couch
111 Pine Street, 15th Floor
San Francisco, CA 94111
(415) 434-1900

Jim Dugan/Linda Strickland
2 Palo Alto Sq. #212
Palo Alto, CA 94304
(415) 493-8700

675 W. 1st St. #409
San Jose, CA 95112
(408) 293-9040

ROBERT HALF OF CALIFORNIA, INC.

EDP/MIS Professionals New England/East Coast/ Nationwide

Robert Kleven and Co., Inc. has a wide variety of positions available in **Programming, Systems Analysis/Design, Data Base Applications, Applications Programming and Software Support** for professionals well versed in the field. If your experience covers one or more of the following areas, contact us: Technical Support, **COBOL/IMS/CICS/DOS/OS/VS/VM/MVS** Programming/Design, Assembly or Higher Level Language, Programming, Data Base Design/Utilization, Hardware and Software Technical Writing.

We've been providing Confidential and Industry-Knowledgeable placement for MIS professionals since 1969. We can also provide you with free resume preparation and career path counseling. Client companies assume all fees.

Contact: Simone Zani.

Robert Kleven and Co., Inc.

INDUSTRIAL RELATIONS MANAGEMENT CONSULTANTS

181 Bedford Street, Lexington, Massachusetts 02173
Telephone (617) 861-1020

Member
Massachusetts Professional Placement Consultants
National Computer Associates
Offices Nationwide
Representing Equal Opportunity Employers M/F

DIRECTOR OF COMPUTER CENTER

SUNY Central Administration seeks a qualified person who can have a major impact on the development and maintenance of computing services for the reporting, planning, evaluation, and budgeting needs of the central administration of the 64-campus SUNY System. The Director of the Computer Center has responsibility for an annual budget of $2.5 million and 55 employees. The current mainframe computer is an IBM 370/168.

Candidates must have a thorough knowledge of computing hardware and a record of accomplishment in academic computing administration at a larger campus or multi-campus system office. The candidate must have a Bachelor's degree or higher, a strong technological background, and demonstrated management, interpersonal, and communicative skills coupled with a willingness to innovate in the management of central computing facilities and in relationships to campus sytems and operations.

Central Administration is located in Albany, New York, in an area rich in history, education, recreational and cultural opportunities. It is ideally located in beautiful upstate New York within easy reach of New York City, Boston, Montreal and New England. Salary in the mid $40's, depending upon qualifications. Appointment to begin August 1, 1982 or earlier.

Please send application and resume before May 1, 1982 to:

State University of New York

Central Administration
Personnel Office - S-125
State University Plaza
Albany, New York 12246

State University of New York is an Equal Opportunity/Affirmative Action Employer

SYSTEMS PROGRAMMER

San Diego

To maintain and enhance TOPS-10 and RSX-11-M operating systems and systems utility programs, plus develop new utility programs as required.

Should have several years experience with both FORTRAN and Assembly language programming, preferably on TOPS-10/20 Decsystem-10, PDP-11 or VAX11/780 computer systems. BS in Computer Science, Math or Engineering and experience with data base software desirable.

To apply send resume to Manager of Employment, General Atomic Co., Dept. CW, P.O. Box 81608, San Diego, CA 92138.

GENERAL ATOMIC COMPANY

Equal Opportunity Employer

DISTRICT MANAGERS SYSTEM/38-N.Y.C. & N.J.

Mincron, a leader in professional software services to the Fortune 500 community, is seeking key individuals for its rapidly growing senior management team.

You will be responsible for new account development and supervision of project leaders.

The successful candidate will have a degree, strong project management experience, IBM System/38 technical expertise, and aggressive marketing skills.

If you are seeking a dynamic and progressive work environment, superb benefits and the opportunity to earn in excess of $60K your first year, then send your resume in confidence to: Business Development Officer.

Mincron sbc CORPORATION

Empire State Bldg., Suite 2810, N.Y., N.Y. 10118

Equal Opportunity Employer M/F

DATA BASE SPECIALIST RIVERSIDE, CA

The Riverside County Superintendent of Schools has an opening for a Data Base Specialist. The County Superintendent operates the Regional Data Processing Center operating dual Burroughs 6900's, utilizing DMSII, CANDE, and COBOL. The Data Base Specialist works in conjunction with the Data Base Supervisor in designing and maintaining administrative, pupil, and financial-payroll-personnel data base bases. Three years programming experience including COBOL, DMSII required; DASDL experience preferred. Competitive salary; fringe benefits include employee and dependent health and dental insurance and employee life insurance. Apply by 4/26/82.

RIVERSIDE COUNTY SUPERINTENDENT OF SCHOOLS
3939 13th Street, Riverside, CA 92502
(714) 788-6666

An Equal Opportunity/Affirmative Action Employer

position announcements | position announcements | position announcements | position announcements | position announcements

Zayre Corporation is a leader in the application of computer technology to manage its retail business. Today our EDP systems help us monitor and manage more than 250 stores in 26 states with total sales in excess of $1.7 billion.

That's a big job. We operate in a multi-CPU environment supporting both batch and distributed networks and a complex telecommunications system links it all together.

Zayre's aggressive 5-year business plan is deeply centered around our automated business systems. We are prepared to offer the qualified professional an excellent compensation package, including salary in excess of $40K for the ideal candidate.

System Programming Manager

We seek a well-seasoned system software professional to lead us in all areas of software planning, acquisition, implementation and maintenance while supervising a staff of technical specialists. You will interface with all MIS departments regarding the use of operating system software. Your department will provide technical assistance dealing with problem solving, hardware evaluation, feasibility studies and configuration optimization with the goal of developing a stable, well-tuned hardware and software environment which includes MVS, JES 2, IMS, TSO and VTAM/NCP.

The ideal candidate will have a BS degree, or equivalent, and at least 5 years DP experience, including at least 2 years as a system programmer. Project leadership experience required. The position reports to a V.P., Manager of Data Processing.

ACT NOW! LOCAL INTERVIEWS CAN BE ARRANGED IN YOUR AREA. Forward your resume, with salary history, to Robin Schwartz, Executive Recruiter, Zayre Corporation, Recruitment Department, Speen Street, Framingham, MA 01701. An equal opportunity/affirmative action employer.

Zayre

Want to move to Upstate New York?

We're the people to see.

From Buffalo to Albany, from Binghamton to Massena, we're the computer and accounting/financial pros who place the computer and accounting/financial pros. That's what we're known for—and we do it with care, personalism and confidentiality. Contact us first!

ALL FEES EMPLOYER PAID

CPA Associates Agency PERSONNEL INC.

ROCHESTER & WEST
Suite 1105, First Federal Plaza
Rochester, N.Y. 14614
Tel. 716/325-5763

SYRACUSE & EAST
2530 James St.
Syracuse, N.Y. 13206
Tel. 315/463-5225

SPECIALIZED AFFILIATES NATIONWIDE
National Computer Associates (NCA) & Accounting Financial Associates (AFA)

Programmer/Analyst

We are looking for a Programmer/Analyst who is currently familiar with IBM 370 or 4300 equipment. An in-depth knowledge of COBOL, DOS/JCL and VSAM is absolutely essential. While exposure to CICS and/or DL/1 would be helpful, an individual with the right credentials will be trained. Will have responsibility for the maintenance and enhancement of the hospital billing system and will receive exposure to DATA BASE AND ON-LINE TRANSACTIONS. A minimum of 2 years' work experience in a DOS environment is required. If you are looking for state-of-the-art technical growth, the Deaconess is the place for you. Salary is commensurate with experience. Exceptional benefits provided.

Forward resumes only to Larry Hunt, New England Deaconess Hospital, 185 Pilgrim Road, Boston, MA 02215. No phone calls, please. An equal opportunity/affirmative action employer.

New England Deaconess Hospital

A Special Place... A Special Pace

NCR SCRIPPS RANCH

One Great Environment Deserves Another.

San Diego

The design and development of interactive software systems thrives at NCR Scripps Ranch. Our modern, quiet facility, designed with a professional in mind, houses a newly developed technical library. We're the creators of some of the world's most innovative commercial software systems and taking on more challenges has created opportunities for the following:

Software Tools Developer — You will design, implement and maintain systems software associated with program development environment. This includes but is not limited to library systems, linkers, source formatters, documentation formatters, and general software tools. Requires BSCS plus 1-5 years program development systems, PASCAL language experience and linker experience.

Operating Systems Analyst — You will be involved in the design and development of interactive software systems emphasizing communications and distributed processing. Areas include systems command language, process management, and communications drivers, using PASCAL-based high level language.

Quality Assurance Systems Analyst — You will use software and systems evaluation techniques to conduct product specification and quality assurance for interactive business systems. Your accountabilities include product reviews and systems analysis. BSCS plus 2 years experience in systems analysis and or applications programming are required.

Systems Program Analyst — You will provide tactical planning of product releases, coordinate and negotiate product release contents and propose and enhance product strategies. This position requires a BSCS degree or business degree 5 years software related experience and product project management experience.

Firmware Systems Developers — You will design and implement firmware for next generation distributed processing systems. This includes work in micro programming, virtual machine emulation, I/O processor, system console firmware and VLSI-based systems. BSCS degree plus 1-3 years firmware design experience, assembly language programming and PASCAL required.

Performance Measurement Analyst — You will measure and analyze the performance of a major software system as well as design of software performance monitor and synthetic benchmarks. BSCS, BSEE and 1-3 years operating systems development experience required, plus performance measurement background preferred.

Add the stimulating professional environment of NCR Scripps Ranch to the relaxing, fulfilling environment of San Diego, and you have found the perfect lifestyle. You will be pleasantly surprised at the variety of affordable housing options available.

Our competitive salaries, our ideal working conditions, our atmosphere of growth through challenge, and our San Diego location combine to make an NCR Scripps Ranch opportunity deserving of your most careful consideration. Send us your resume today.

NCR
Complete Computer Systems
An Equal Opportunity Employer

Dept. U55
Sharon Jordan, Personnel Resources
Systems Engineering, NCR Corporation
9900 Old Grove Road, San Diego, CA 92131

BRYANT COLLEGE
FACULTY POSITIONS AVAILABLE

Bryant College, founded in 1863, is one of the nation's oldest specialized professional colleges. Since 1971 it has occupied an extremely attractive contemporary campus, which is spread over 296 acres in northern Rhode Island, 12 miles from Providence and 50 miles from Boston. The College is a selective, private, and coeducational institution which predominantly offers bachelor's and master's degrees in professional business studies.

Bryant College enrolls 3,000 undergraduate students in its Day School, 1,800 undergraduates in its Evening School, and 1,400 graduate students in its MBA and MS programs. The College's undergraduate programs include studies in the liberal arts and sciences, and concentrations of professional study in Accounting, Computer Information Systems, Economics, Institutional Management, Management, and Marketing. It has also introduced new programs in Actuarial Mathematics and Business Communications. Graduate programs in Accounting, Health Care Management, Public Management, and Taxation are available at the MBA level in the Graduate School. The College also offers extensive continuing professional education through its Center for Management Development.

Bryant College is interested in hearing from people who wish to advance themselves as educators in the positions listed below at a strong, developing institution. Although research is encouraged and supported, special attention is given to conscientious, inspired, and inspiring teaching. In all vacancies professional ranks are open, positions have been budgeted to provide for senior-level appointments, and salaries are nationally competitive. Bryant's fringe benefit package is also excellent. Opportunities for special session teaching and for assignments in the College's Center for Management Development are also available. Starting salaries for these tenure-tracking positions will depend upon background and experience in college teaching and related professional activities. All positions are budgeted for September of 1982. Applications will be reviewed until positions are filled.

ACCOUNTING. Two positions, one teaching in Accounting Information Systems and Auditing Systems, the second for Introductory Accounting, Intermediate Accounting, and other courses. Ph.D. or D.B.A. preferred. ABD or doctorally-inclined MBA/CPA candidates will be considered.

COMPUTER INFORMATION SYSTEMS. Three positions, one teaching in Systems Analysis and Design, another in Programming Languages (COBOL, primarily), and a third in Management Science. Also, fundamental DP courses are regularly offered. Ph.D. or D.B.A. preferred. ABD or doctorally inclined MS/MBA candidates will be considered.

ECONOMICS. One position, teaching fundamentals courses (Microeconomics and Macroeconomics) as well as International Trade and Comparative Economic Systems. Ph.D. or D.B.A. preferred. ABD will be considered.

MANAGEMENT. Two positions, one teaching in Production and Operations Management, the other for someone with a high technology background to teach Analysis of Industry, courses in productivity, and related areas. Ph.D. or D.B.A. preferred. ABD's will be considered.

MARKETING. Two positions, one teaching in Marketing Research, the other in Sales Management. Also, introductory courses are regularly offered. Ph.D. or D.B.A. preferred. ABD's or doctorally inclined MBA/CPA candidates will be considered.

Please send a letter of application and a resume to Dr. Stanley J. Kozhowski, Dean of Undergraduate Faculty, Bryant College, Smithfield, RI 02917.

Bryant College is an affirmative action, equal opportunity employer.

position announcements | position announcements | position announcements | position announcements | position announcements

Fail-Safe, Transaction Processing Systems

We're growing so you can too!

When you think National you probably think semiconductor. But we're also rapidly becoming the industry's systems leader. Explore these opportunities to join the company that is committed to new products, new technologies and you.

Data Communications Software Specialist

This position offers excellent career development and advancement potential in the data communications field. Using your creative resources, you will integrate our system into an SNA network utilizing the latest technological advances, data link protocols and network architecture. If you have a strong background in IBM SNA including knowledge of data link protocol and networking you may qualify for this position.

Firmware Development Engineers

Program intelligent terminals or I/O controllers for a new generation of software products. This excellent opportunity involves software/firmware development on Z80 microprocessor based systems. A proven track record in one or more of the following areas may qualify you for this position: assembler or microprocessor programming (Z80 preferred); intelligent terminal or I/O controller firmware development; operating systems programming.

Systems Programmer/ Operating Systems Development

Device handling is the key in this position as you will interface between device handlers and board-level systems. You will also provide operating system enhancement and support to a highly advanced system. If you are a self-starter with strong communication skills, have a BS/CS and proven experience in operating systems, and Assembly language programming, you'll want to explore this promotable opportunity.

Software Test Simulation/ Development Programmer

We have positions available that will provide you with an opportunity to develop real-time software which simulates terminal network and point-of-sale system interface. You'll use advanced development resources such as a VAX 11/780 running VMS with target implementation on a Z80 based microprocessor to review and develop product requirements including internal/external design specifications. A BS in computer science, or equivalent experience, and 1-3 years' experience in Assembly programming; PASCAL preferred. We're looking for a true professional with polished communication skills and knowledge of the software development process from beginning to end.

Please send your resume to Terry Hill, Professional Recruitment, National Semiconductor, P.O. Box 60879, Sunnyvale, CA 94088, or call (408) 737-4842. We are an equal opportunity affirmative action employer.

National Semiconductor

DALLAS SUN BELT NATIONWIDE

Programmers, Analysts, Software Specialists: Let us assist you in your career advancement as we have hundreds of computer professionals like yourself since 1970.

In Dallas, our clientele consists of virtually every major data processing installation as well as numerous smaller organizations. Nationally, through our network of 30 offices, we represent thousands of career opportunities across the entire U.S. Send our professionals your resume or call us today!

DataPro DATA PROCESSING PERSONNEL CONSULTANTS

12720 HILLCREST - SUITE 520
DALLAS, TEXAS 75230 (214)661-8600
All fees paid by client companies.

Member of National Computer Associates

DATA PROCESSING PROFESSIONALS

NBC has challenging positions on our Applications Systems Group in our West Coast MIS Department for

- **Senior Systems Analysts**
- **Project Leaders**

We have currently installed a UNIVAC 1100/84 with associated peripherals, DCP/4040 Front-end and anticipate delivery of the new CACHE-DISK subsystems in 1982.

Applications running in this system include Broadcast & Finance on-line and batch systems, which are an integral part of NBC's Television & Broadcasting Operations. All positions require a minimum of 2 years UNIVAC 1100 experience utilizing COBOL and DMS. A Bachelor's degree in a related subject is preferred.

At NBC we offer an exciting work environment, an excellent benefits package and salary commensurate with experience. Prompt, confidential consideration will be given to all applicants. Please submit resume with salary history to

NBC Employment Department-DPP
3000 W. Alameda Avenue
Burbank, CA 91523

NATIONAL BROADCASTING COMPANY

ARE YOU A PROFESSIONAL DATA PROCESSOR?

If you are, one of the Pacific Northwest's largest and most respected data processing service companies may have the immediate challenge and professional growth opportunity you need.

Immediate openings are for PROGRAMMER ANALYSTS with COBOL, PRIME or other superminicomputer, and interactive systems experience. Preferred applications expertise is in financial systems and higher education administrative systems. One position entails sales support and travel. Ability and desire to work harmoniously with users is essential.

Please send resume with salary history to:

Ray Waller
COMPUTER MANAGEMENT SERVICES, INC.
0234 S.W. Bancroft
Portland, OR 97201

Academic Computing Center Systems Support/Programming

Clarkson College of Technology, in upstate New York, is seeking individuals with experience in one or more of the following areas: system support and enhancement, development using both machine-level and high-level programming, and telecommunications. The Schuler Resources Center furnishes the College with central computing facilities for instructional, research and administrative functions. Presently installed is an IBM 4341 Group 2 with 120 ports, running MUSIC and OS/VS1/HASP under VM/370. A VAX 11/780 with 32 ports is scheduled for installation in June, primarily for graphics applications. A broadband cable network using X.25 packet switching will provide access to these and future systems throughout the campus. Clarkson plans to provide to the students and faculty a comprehensive network of computing capabilities, including widespread use of personal computers.

Our systems group operates in an open environment, where each individual is encouraged to promote and develop ideas into actively supported projects. We offer an excellent benefit package, and our employees have the opportunity to enter Bachelors, Masters, and Doctoral degree programs. Send resume and salary requirements, in confidence, to: Richard D. Valente, Schuler Resources Center, Clarkson College, Potsdam, New York 13676.

An Equal Employment/Affirmative Action Employer

HOUSTON

Land of Opportunity? Not for everyone, but yes if you have large scale IBM DOS or OS exp. in Banking, Manufacturing, Accounting applications, D-B Analysts or Systems Programming

Programmers (2+ Yrs.)	To 28K
Programmer/Analyst	To 32K
Systems Analyst	To 35K
Data Base Analysts	To 40K
Systems Programmers	To 40K
MSA-Payroll/Personnel	To 35K
UCC-FCS	To 35K

CALL JIM FLEMING TODAY AT (713) 686-1800

ROBERT HALF OF HOUSTON, INC.
720 North Post Oak Rd., #225
Houston, Texas 77024
(713) 686-1800

Snow's Recruiters

Alaska's top companies are seeking the following experienced professionals.

PROGRAMMER ANALYST
SYSTEMS ANALYST
SENIOR SYSTEMS PROGRAMMER
EDP AUDITOR
COMPUTER OPERATIONS MANAGER

Alaska offers a suburban/rural lifestyle with no state income tax, no sales tax, low property taxes, clean air and no long commutes to work. All fees paid. Relocation package available. Send resume in confidence to SNOW'S RECRUITERS, 880 N Street, Suite 303, Anchorage, Alaska 99501. EOE

SENIOR EDP AUDITOR

Our rapidly expanding energy company involved in the interstate transmission of natural gas, has an excellent career opportunity for a Senior EDP Auditor to join our team of dedicated professionals. You will plan and perform audits of the corporate management information systems operating under an IBM/3081 environment. Selected candidate will have 3 - 6 years combined data processing, audit, and/or EDP audit experience and a Bachelor's degree in Business or Computer Science. Exposure to IMS DB/DC, and TSO a definite plus.

Northwest offers excellent company paid benefits. Salary commensurate with experience. For immediate consideration, please send your resume in confidence to: NORTHWEST PIPELINE CORPORATION, Attn: W. L. Owen, P.O. Box 1526, Salt Lake City, UT 84110, or call COLLECT at 1-801-534-3921. We are an equal opportunity employer m/f.

NORTHWEST PIPELINE CORPORATION

Sunbelt Stimulating Growth Opportunities In A Sophisticated Installation

Programmer Analyst Immediate Opening

Performs complete cycle of developmental activities from analysis to installation of complex real-time Data Base systems. Knowledge of systems design and COBOL programming. Outstanding opportunity for motivated self starters. Salary $21,361-29,211.

To apply send resume to: Oklahoma City Personnel Dept., 201 Channing Square, Room 86, Oklahoma City, OK 73102. Attn: Savada Carter, 405/231-2403.

Closing date: May 7, 1982.

EOE

PHILADELPHIA

DP INSTRUCTOR TO 27K

Large Central Jersey data center seeks 2 yrs exp as trainer to teach COBOL, JCL, h/ware/s/ware concepts to in-house personnel. Reqs good platform skills. OUTSTANDING BENEFITS & RELO PKG.

Contact: Regina Nardelman

ROBERT HALF OF PHILADELPHIA, INC.
2000 Market St., Suite 750
Philadelphia, PA 19103
(215) 568-4580

We Specialize In

DATA/VOICE COMMUNICATIONS

$25K to $45K

We have many outstanding opportunities throughout the nation

Voice/Data Networking
Hardware/Software

Fortune

154 Broad St. Dept. C
Nashua, N.H. 03063
(603) 880-8880

COMPUTER PROGRAMMER

Computer Programmer with demonstrated knowledge of PL1, OS/JCL for implementation of an interactive on-line accounting system. Successful applicant will be responsible for coding, testing, debugging, and conversion of an existing PL1 batch system from OS/MVS/370 mainframe to IBM-Series/1 minicomputer. Knowledge of assembly language and familiarity with computer accounting systems together with a Master's degree in computer science; or a Bachelor's degree in Computer Science and one year experience in computer programming on PL1 OS/JCL systems and minicomputers required. Salary $19,000 per year.

Reply to:

#0226635
Ohio Bureau of Employment Services
300 South Fourth St., P.O.Box 18631
Columbus, OH 43216

PROJECT LEADER DEC CTS-300

Expanding Systems House has an immediate need for a qualified professional with at least 2 years of CTS-300, DIBOL experience.

Send Resume to:
Shelly Wolfe
SRI Computer Systems
4900 Waters Edge Drive
Raleigh, NC 27606
(919) 851-1526

COMPUTER SCIENCE FACULTY POSITIONS

Computer Science Faculty positions at Assistant Professor, Associate Professor and Professor levels are anticipated for the Academic year starting in August 1982. Ph.D in Computer Science preferred but doctorate in related field combined with appropriate experience will be considered. The Department offers B.S. and M.S. Degrees. Send inquiries and resumes by April 1, 1982 to Dr. H. Saha, P.O. Box 86, Department of Computer Science, Alabama A & M University, Normal, AL 35762.

An Affirmative Action/ Equal Opportunity Employer

position announcements | position announcements | position announcements | position announcements | position announcements

Master Terminal Operators

San Francisco Area

If you're the type of person who sees things in a different light, and would like a place to put your innovative ideas to use, consider a career with the Bank of America.

Our Electronic Banking Services Division, headquartered in San Francisco, is continuing to define the future of electronic banking systems, and offers DP professionals virtually unlimited career advancement opportunities. Presently, we're looking for Master Terminal Operators to operate IBM 3033 MP or IBM-3081 and deliver on-line services to Northern California Bank of America customers, branches, and administrative units. To qualify, you will need 2 years' experience with IMS MTO with DB/DC, VTAM, OS/MVS, JES 2 or 3, and IBM mainframe operations. You will also need excellent oral and written communication skills and the flexibility to work overtime, weekends and various shifts.

We offer competitive salaries and benefits and the chance to join a world leader. To respond, we invite you to send resume, with salary information to: Gwendolyn Gomez, Electronic Banking Services Division, Systems Recruitment Dept. 3442-GGC, P.O. Box 37000, San Francisco, CA 94137. An equal opportunity employer.

Where vision becomes reality...

BANK OF AMERICA

ABU DHABI NATIONAL OIL COMPANY

OPPORTUNITIES AVAILABLE FOR COMPUTER PROFESSIONALS

ADNOC is one of the major oil companies in the Middle East controlling the Exploration, Production and Distribution of Oil, Gas and Associated products in Abu, Dhabi.

WE are providing Data Processing facilities under TP and Database environments to our Group of companies, with a wide communications Network and a number of mainframes.

We require a wide range of suitably qualified and experienced DP staff in the areas of Petroleum Engineering and Commercial applications.

Vacancies exist in :

1. APPLICATION DEVELOPMENT AND SUPPORT

- SENIOR SYSTEM ANALYSTS
- DATABASE ADMINISTRATORS
- ANALYST/PROGRAMMERS & PROGRAMMERS

The candidates should have a university degree and 3 to 8 years experience in one of the following areas :

SYSTEM ANALYSIS, DESIGN and PROGRAMMING (COBOL/FORTRAN), PLANNING, QUALITY ASSURANCE, IDMS DATABASE and TP SYSTEMS.

Some positions also require experience in Geological Databases, Contouring or Reservoir Modelling. A degree in Science or Engineering is required for these positions.

2. SYSTEM SUPPORT

- DATABASE SUPERVISOR
- SYSTEM ENGINEERS

The candidates should have a university degree and 3 to 8 years experience in one of the following activities :

ICL VME/B and IDMS Support, IBM DOS/VSE Support, COMMUNICATION INTERFACES and PROTOCOLS, NETWORK MANAGEMENT and PERFORMANCE ANALYSIS.

3. OPERATIONS

- SHIFT LEADERS
- SENIOR OPERATORS & OPERATORS
- PRODUCTION CONTROLLERS

The candidates should have adequate education and sound operational knowledge on large ICL and IBM mainframe operations.

ADNOC benefits include a high tax free remuneration, good career prospects, free medical care, free furnished family accommodation, paid home leave for the family and educational assistance.

Knowledge of Arabic for all positions will be an advantage.

Interested candidates are invited to forward their detailed applications, together with photocopies of their education and experience certificates, within two weeks from the date hereof to :

PERSONNEL DIRECTORATE - EMPLOYMENT DIVISION
ABU DHABI NATIONAL OIL COMPANY - (ADNOC)
P.O. BOX 898 - ABU DHABI - U.A.E.

MOUNTAINS OF NEW MEXICO

Sacramento Peak Observatory, an optical solar observatory, located in the Lincoln National Forest in Southeastern New Mexico, has an opening for a

REAL-TIME/APPLICATIONS MINICOMPUTER PROGRAMMER

to work on a variety of challenging problems associated with instrument control and data acquisition, processing and reduction. Hardware includes:

- Perkin-Elmer 3242 and 3220's
- Xerox Sigma 3
- Floating Point Systems AP-120B Array Processors

You should have

- B.S. or advanced degree
- Ability to work with minimum supervision
- Real time or scientific applications programming experience

Send your resume, including salary history to

Frank Hegner
Sacramento Peak Observatory
Sunspot, NM 88349

An Equal Opportunity Employer

Data Processing

Systems Programming Manager

This key position is with a highly respected LA area company that recognizes the value of management skills in a highly technical environment. Budgetary and state-of-the-art computing resources have been allocated to make your task easier.

Of course, results will be expected, and we believe you will achieve the best results if you are successfully managing and providing technical direction for a staff of systems programmers in your present job. Your systems programming experience/training should be in a large scale IBM OS/MVS data center with a working knowledge of TSO, SPF, ACF/VTAM, NCP, IMS DB/DC and CICS. While we need a strong, logical technician, we also insist on an efficient and user-sensitive manager.

Excellent benefits, salary, facilities and promotional opportunities. Principals only need apply. Please send resume or brief inquiry to:

CW-A3231, Computerworld
Box 880, Framingham, MA 01701

Equal Opportunity Employer

COMPUTER PROGRAMMER

To implement clinical, financial administrative data base systems in a 350-bed teaching hospital in Saudi Arabia. IBM exp., 2 yrs. CICS macro language exp., as well as Assembler language programming skills.

FINANCIAL/ CLINICAL SYSTEMS ANALYST

Candidate will work with client personnel in designing and implementing clinical, financial and administrative computer systems for 350-bed teaching hospital in Saudi Arabia. Degreed. 3-5 yrs. exp. preferably in health care or related field.

For immediate consideration, please send resume to:

HE INTERNATIONAL, INC.
77 Cadillac Drive, Suite 180
Sacramento, CA 95825

PROGRAMMER/ANALYST AND APPLICATIONS PROGRAMMER

Staff positions for development and support of relational database applications in the School of Engineering at MIT. Duties will include design and coding of new applications; maintenance and enhancement of existing management information systems; documentation of applications packages; advising and assisting users. Opportunities for participating in overall design decisions and for educating users and potential users. Interest in working closely with users essential. Programming experience is required, while a bachelor's degree is preferred. PL/1, MULTICS, or database experience especially helpful.

Applicants should send resume, statement of professional goals, and names of references to:

Prof. F. C. Hennie
Rm. 38-435
Massachusetts Institute of Technology
77 Massachusetts Ave.
Cambridge, MA 02139

MIT is an equal opportunity/affirmative action employer

MIT

SOFTWARE DEVELOPMENT

APPLIED DATA RESEARCH is continuing its search for all levels of qualified programming personnel. Positions currently available involve assignments in software development for the following ADR products:

VOLLIE®
LOOK® (OS/DOS)
MetaCOBOL®
DATACOM®
ROSCOE®
ETC®
The LIBRARIAN®
EMPIRE®

Candidates must have a minimum of 2 years programming experience and strong IBM/ALC skills. Degree preferred but not required.

ADR offers a highly desirable work environment which allows employees advancement into new and challenging assignments at a rate commensurate with their interests and ability. ADR also offers outstanding benefits and excellent compensation.

Resumes may be sent to Mr. E. Smith, Director of Technical Recruiting. All replies will be held in strictest confidence.

APPLIED DATA RESEARCH is the world's oldest and largest independent system software products company.

APPLIED DATA RESEARCH, INC.
Rte. 206 & Orchard Rd. CN-8
Princeton, New Jersey 08540

An Equal Opportunity Employer, M/F/H/V

ADR

FT. WORTH

DOC/CICS SYSTEMS PROGRAMMER TO $32K

Fully responsible for all systems & TP support in new IBM 4341 data base environment. Stable profitable co., relo assistance provided.

Suite 911 One Summit Ave
Ft Worth TX 76102 (817)336-4565

DATA PROCESSING CAREERS INC

KANSAS CITY

We represent the finest clients in K.C. & throughout the midwest. Outstanding opportunities exist for Programmers, Analysts, Software Programmers, Data Base Analysts and Data Communication Analysts. Salary range $25-40k.

6405 Metcalf Shawnee Mission Kansas 66202 (913) 236-8288

DATA PROCESSING CAREERS INC

DALLAS

KEY STAFF POSITION

Previous MVS systems software programming bkgrnd qualifys for this spot. You will do performance measurement, tuning, capacity planning, support DASD RMF, OMEGAMON, SAS, SAC etc as resource tools. Solid, financially strong co. Full relo, fee pad., to $38K.

2730 Stemmons Frwy., 1108W
Dallas, TX 75207, (214) 637-6300

DATA PROCESSING CAREERS INC

TULSA

UNIVAC-DATA BASE

Excellent firm in NE Oklahoma requires a minimum of 3 yrs exper. using DMS-1100. All fees & relo. pd with starting salary in the low $30's.

2828 E 21St., Tulsa, OK 74114
(918) 747-3621

DATA PROCESSING CAREERS

COMPUTER CENTER DIRECTOR

WEBER STATE COLLEGE OGDEN UTAH

Candidate will manage a computer center which includes both on campus academic computing and administrative data processing and software development for a state wide seven college network. The center serves 11,000 students with a 130 terminal DEC computer network and is currently acquiring a second large system for academic computing. Weber State is an undergraduate liberal arts, professional and vocation-technical college with some graduate programs. It is located at the base of the Wasatch Mountains, and offers superb skiing, hiking, fishing and cultural opportunities, and is only 40 minutes from metropolitan Salt Lake City. Candidate must possess a demonstrated excellence in management, and coordinative capabilities and competence in technical computer skills. Bachelors degree and five years experience required, experience at a college or university would be helpful. Salary negotiable, application deadline April 20. Send resume, salary history and three letters of reference to:

Dr. Kim Wheatley
Personnel Department - 1016
Weber State College
Ogden, Utah 84408

WSC is an Equal Opportunity Affirmative action Employer M/F

WE'RE LOOKING FOR A PROGRAMMER AS SOPHISTICATED AS OUR EQUIPMENT

We're a major financial institution in search of an individual with expertise in Cobol Programming. We have an excellent position available for someone who combines at least a year's experience in 3890 and DOSCHECK with boundless ambition. A familiarity with banking or accounting processes would be helpful.

If you're at ease in an IBM 370 DOS/VS environment and are hardwired for success this is the career move for you.

We can offer you an excellent benefit package and a salary commensurate with your skills and experience.

Send your resume and salary requirements to:

JR Box 482C Suite 1900
271 Madison Avenue
New York, N.Y. 10016

Equal opportunity employer M/F

NEW HAMPSHIRE

$25 - $45K

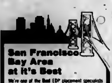
Applications and Systems Software

Micro/Mini/Mainframe

Management Advisory Services Inc

Colonial Office Park
46 Constitution Drive
Bedford, NH 03102
(603) 472-8844

Fees and relocation expenses company paid.



San Francisco Bay Area at it's Best

We're one of the Best EDP placement specialists in the San Francisco Bay Area. We know what companies are offering the best technology. Who's paying the best salaries. Where the best growth opportunities are.

We guarantee you personalized professional help in matching your skills and ambitions to a career that will bring you the recognition and financial rewards you are seeking.

If you're an experienced D.P. Professional CALL COLLECT or RUSH your resume TODAY

LOGICAL OPTIONS
One Market Plaza, Spear Tower, Suite #2014C
San Francisco, CA 94105 • (415) 777-3900

DIRECTOR COMPUTING AND INFORMATION SERVICES THE UNIVERSITY OF GEORGIA

The University of Georgia invites applications and nominations for Director of the Office of Computing and Information Services. Responsibilities include management of the computing facilities (two IBM 370/158 AP systems, a CDC Omega II, a CDC Omega III, a CDC Cyber 750, and a Denelcor HEP) and a staff of 95 people. Qualified applicants should have at least 10 years supervisory and managerial experience in a large academic computing facility, a working knowledge of telecommunications networks and distributed data processing, appropriate technical background in computer systems and their uses in academic institutions, excellent oral and written communications skills, and hold a graduate degree. Please submit resume, with references and salary requirements, postmarked by May 15, 1982 to:

Mr. David Bishop, Chairman
Screening Committee
The University of Georgia
Library Administration
Main Library
Athens, Georgia 30602

An Equal Opportunity/ Affirmative Action Institution

DIRECTOR OF COMPUTER SERVICES

New Hampshire College located on a beautiful campus environment in Manchester, N.H. is seeking an experienced Data Processing professional to assume the responsibility for the management of its IBM 370/4341 Centralized Computer Facility and distributed Data Processing capabilities. The director reports to the office of the President and will work closely with administrators and faculty to ensure the development and provision of computer support for management, instruction and research. Qualified candidates should have at least 4 years experience as a manager or assistant manager of a medium size facility with experience in on-line information system design, implementation and maintenance; and a thorough knowledge of large mainframe and micro data processing hardware, software and telecommunications. Experience with VM, DOS, CICS and Database Management Systems preferred. Only those with appropriate credentials will receive a response. Please send resume by April 17, 1982 to: Pamela Perkins, Personnel Office, New Hampshire College, 2500 North River Road, Manchester, NH 03104.

EOE/AA

FLORIDA

availABILITY

All Expenses Paid

Our clients, in urgent need of your expertise will pay all your expenses in relocating you to an area of Sun & Fun, No State Tax.

Average Temperature 75°.

PROGRAMMER ANALYSTS
SYSTEMS ANALYSTS
SYSTEMS PROGRAMMERS
DATA BASE ANALYSTS

AVAILABILITY INC

RELOCATE TO SANTA FE, NEW MEXICO CENTRAL JUSTICE INFORMATION SYSTEM PROJECT LEADER

The individual selected for this position will coordinate the planning, implementation, and ongoing use and operation of a computerized Central Justice Information System among state and local law-enforcement, corrections, district attorneys, and court agencies in the State of New Mexico.

The position requires an extensive knowledge of data processing; criminal, civil, and juvenile components of justice systems; management skills in the areas of planning, supervision; and management needs of justice organizations. A bachelor's degree or equivalent combination of experience and/or training is also required.

SALARY: Up to $36,000 Depending Upon Qualifications.

Submit resume and references to the attention of the CJIS Committee by May 1, 1982, Data Processing and Data Communications Planning Council, 1219 Luisa Street, Suite 3, Santa Fe, New Mexico 87501.

AN EQUAL OPPORTUNITY EMPLOYER M/F

OHIO UNIVERSITY TECHNICAL SUPPORT MANAGER

A position is immediately available for a senior level person to provide indepth technical support in maintaining, operating, and procuring computer systems and related equipment to include network management. This position reports directly to the Director of Computer Services. The areas that report directly to this position are: Computer Operations, Telecommunications, Large Systems Software Support, and Small Systems Software Support. Experience with some or all of the following systems would be helpful: IBM 4341, IBM 370-158, IBM System 34, IBM Series 1, DEC VAX 750, DEC PDP 11/44, HP 1000, & HP 3000. Degree in Computer Science is preferred with a minimum of 5 years experience in System Development/Analysis/Design/Programming and 2 years in supervisory or management capacity. Excellent communications ability a must. Excellent benefit package. Salary to $32,800.00, dependent upon qualifications. Application deadline is May 3, 1982. Please send resume to:

Larry Buell
Director, Computer Services
Ohio University
Haning Hall
Athens, Ohio 45701

DALLAS

SR SYSTEMS ANALYST

Company involved in the oil and gas industry. Looking for approx. 5 yrs. exp. design and developing acctg application. RPG programming abilities mandatory, company has a IBM 4341.

To $32,000

PROGRAMMER ANALYST

Steadily growing central Texas manufacturing company is looking for a COBOL programmer with two yrs. exp. Must have IBM OS or DOS exp.

To $25,000

CONTACT: John Sleigh

SNELLING AND SNELLING OF DALLAS, INC (214)[illegible]
Two NorthPark East Suite #750
Dallas, Texas 75231

HARDWARE FIELD ENGINEER

A Northwest independent Maintenance organization is in need of a IBM large system trained field engineer in Portland, Oregon. Engineer must have a minimum of 4 years experience on IBM or IBM compatible equipment. Excellent growth opportunity in the beautiful northwest.

Please send resume to
Dynamic Computer Maintenance Inc.
3600 S.W. Corbett
Portland, Oregon 97201
Or Call Dean Myers at
503/241-3194

SYSTEMS ANALYSTS AND PROGRAMMERS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Every day new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Rapids, CPC, Data Processing Specialist.

Dunhill

Of CHARLOTTE, INC.
5401 Central Road, Suite 107
Charlotte, North Carolina 28211
[illegible]
[illegible]
[illegible]

Programmer/Analyst

There is nothing to match the talent of a contemporary and progressive library system. And more specifically there is nothing to match the talent of the pleasant growth oriented environment of the public library of Columbus and Franklin County. The library is in the process of installing a Hewlett Packard 3000/64 computer system and implementing major on-line applications for an automated bibliographic data base/circulation system, materials acquisition system and other related administrative systems. The incumbent must have a minimum of 3 years programming experience with structured COBOL in an on-line programming environment. Experience with HP 3000 computer system software: MPE, IMAGE and HP UTILITIES is desirable. As a leader in the field of library automation, we offer a competitive salary of $22,236, comprehensive benefits and a style of management which provides a long term career opportunity. For prompt confidential consideration, send resume and salary history to Personnel Department, Public Library of Columbus and Franklin County, 28 South Hamilton Road, Columbus, OH 43213.

EOE

BURROUGHS PROGRAMMER TO $30K

Our client, located in the WESTERN SUBURBS of PHILA. reqs min 1 yr exp w/GEMCOS and MCP. Knlg of ALGOL & COBOL on med & lge BURROUGHS mainframes will qualify you for one of the BEST RELO PKGES offered in the industry. Conversion exp +. Co is witnessing tremendous growth. VERY STABLE. IMMED INTV

Contact: [illegible]

McFadden
311 Church Road
Suite 216
Cherry Hill, NJ 08002
[illegible]

position announcements | position announcements | position announcements | position announcements | position announcements

UNIVAC 1100 SYSTEMS PROGRAMMER

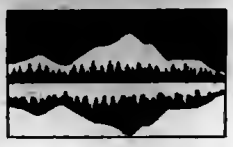
SAN FRANCISCO BAY AREA

The Lawrence Livermore National Laboratory, a nationally recognized scientific laboratory, has completed the transition and conversion to a Univac 1100/81 in its Administrative Information Systems data center. An experienced Systems Programmer is needed to assist in the generation, implementation, and maintenance of the Sperry-Univac Series 1100 Executive, currently level 37R2C. Related duties include technical support and consultation with users, analysis of software problems, and system performance evaluation.

Applicant should have a BS in computer science. A Master's degree is preferable. Must have significant experience with Univac 1100 hardware and software in a systems programming capacity. Salary commensurate with experience. Interested and qualified applicants should forward a resume with salary history and requirements to: Sue Porter, Employment Division, Lawrence Livermore National Laboratory, P.O. Box 5510, Livermore, CA 94550, (415) 422-8378. U.S. Citizenship is required.

University of California
Lawrence Livermore National Laboratory

Career Opportunities in Data Processing



Washington Public Power Supply System is meeting the challenge of bringing three nuclear power plants on line as soon as possible. This means opportunity in the area of Information Systems. We currently have the following position available:

Technical Support Analyst

An individual with technical knowledge of computer hardware, data communications and system software is needed to analyze requirements, and design, specify and implement computer hardware and teleprocessing networks.

Five years of progressively responsible experience in data processing and effective written and verbal communication skills are required.

If this opportunity appeals to you, send your resume and salary history to:

Elaine Heffner, Dept. EH J4 A1
Washington Public Power Supply System
P.O. Box 968
Richland, WA 99352

The Supply System is an affirmative action employer.

SUPPLY SYSTEM

EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies
and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees. We guide, you decide.

RSVP SERVICES, Dept. C
Suite 700, One Cherry Hill Mall
P.O. Box 5013
Cherry Hill, New Jersey 08034
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 211, Dublin Hall
1777 Walton Road
Blue Bell, Penna. 19422
(215) 629-0595

RSVP SERVICES
Employment Agents for Computer Professionals

there's a method to our growth

Dominion Bankshares Corporation

Roanoke, Virginia

We're among the leaders in Virginia's progressive banking industry. We're DOMINION BANKSHARES CORPORATION, a $2.7 billion bank holding company committed to keeping pace with the latest technology in a rapidly changing market. OUR STRATEGY incorporates proven techniques in business systems development, identification and analysis and provides MIS professionals an environment which will:

- Broaden professional experience
- Enhance technical knowledge
- Continue career advancement

Our host computer center in Roanoke provides statewide support for 150+ branches utilizing IBM 3033/168 MVS, CICS, VTAM, NCP, PDP-11/70, RSTS/E V.7.0., a statewide TP network and interface with remote 4300 Center.

Write your own career ticket in one of the following capacities:

SYSTEMS/COMPUTER ANALYSTS

5-8 years DP experience with degree preferred, proficiency in COBOL and at least one of the following: CICS, ALC, PL/1, RPG, BASIC, Easytrieve. Proficiency in JCL and OS Utilities, systems development methodology concepts and bank-related applications/operations (especially CPCS or DOSCHECK).

SR. PROCEDURES ANALYST

Degree with experience in technical writing, procedures, systems research and development in a DP environment. Experience in technical writing for DP and/or MIS in a comparable environment a plus.

APPLICATIONS PROGRAMMERS

2-5 years DP experience including 1-3 years proficiency in COBOL with degree preferred. Working knowledge in at least one of: CICS, ALC, PL/1, BASIC, Easytrieve a plus. Experience in banking applications/operations (CPCS, DOSCHECK, Deposits, ATM, Card Management Loans) desirable.

TRAINING SPECIALIST

Programming experience in a comparable DP environment with knowledge of teaching techniques to present established, basic curriculum for new staff members and trainees.

DOMINION BANKSHARES CORPORATION offers performance-based compensation, comprehensive benefits (medical, dental, profit sharing, stock purchase) and relocation assistance.

INCLUDE US IN YOUR CAREER STRATEGY!
Call Mary Ann Bailey, Professional and Technical Recruiter,
(703) 563-7907

Or send a current resume with salary requirement to her attention at: Dominion Bankshares Corporation, P.O. Box 13327, Roanoke, Virginia 24040. An Equal Opportunity Employer M/F/H.

CONNECTICUT is A Great Place To Live & Work!

If you're looking for affordable housing in an area with no state income tax, consider the growth opportunities our clients have for:

- *Programmers
- *Analysts
- *Systems Programmers
- *Project Leaders

Desire experience with any of the following disciplines:

- *COBOL or ASSEMBLER
- *On-Line exp with CICS
- *DB2
- *3+ yrs. large-scale IBM
- *Insurance or Financial Systems Design/Programming

The 80's offer us exciting prospects and challenges for growth. Everyone wants to help you, but not everyone can. We've built a solid reputation for professionalism and can't afford to settle for doing any less than the best for you. Our clients will assume search fees, interview & relocation expenses for directly related experience. Please direct a copy of your resume, stating geographic preferences & current salary to:

CONNECTICUT, INC.
990 Asylum Ave.,
Hartford, CT. 06105
(203) 549-4240

"We are an equal opportunity employer retained search & placement firm."

A Member of National Computer Associates Offices Nationally

SYSTEMS ANALYST/ PROGRAMMER

There's nothing to match the challenge of a contemporary and progressive medical center. And there's nothing to match the challenge of the environment of Trinity Medical Center.

We're a non-profit 700-bed medical center serving northwestern North Dakota and eastern Montana. We have a full time position available for the right person to work in our Data Processing Department. The applicant should have 2-4 years experience in Data Processing through knowledge of COBOL, and experience with on-line systems and Data Base. One will work in designing and programming new on-line systems using Data Base.

If you're looking for a challenge and a new position, look to Trinity Medical Center. Excellent salary awaits along with many superb benefits. For further information please feel free to write or call, collect:

Personnel Office

TRINITY MEDICAL CENTER

Burdick Expressway at Main St.
Minot, North Dakota 58701
701-857-5191

Equal Opportunity Employer M/F

position announcements | position announcements | position announcements | position announcements | position announcements

Computer Professionals

Join the Space Shuttle Launch Team at Computer Sciences Corporation!!

Computer Sciences Corporation's Applied Technology Division at the Kennedy Space Center has immediate openings for career oriented professionals interested in the challenge of working in support of CSC's Space Shuttle Launch Team and associated data processing activities. Available opportunities exist for the following professional areas:

COMPUTER ANALYSTS

BS/BA Degree required, plus 2-6 years of previous experience. To provide operational analysis/support for large scale computer systems to include system problem troubleshooting and customer batch processing.

BUSINESS AND SCIENTIFIC PROGRAMMER ANALYSTS

BS Degree in Computer Science or Math, 2-6 years experience in either COBOL and Database applications on large scale systems or 2-6 years experience in Fortran and Assembler applications on large scale or mini computer systems.

TELEMETRY ENGINEERS

BSEE with 4-6 years experience in operations and maintenance in support of a telemetry data processing environment. Knowledge of micro and mini computer hardware is highly desirable.

Computer Sciences Corporation offers outstanding opportunities for career growth and development, competitive salaries, and a full range of company paid benefits. For more information, call or send resume, including salary history to: **MICHAEL R. GOGGINS, (305) 453-7472, Monday-Friday, 8 a.m.-5 p.m.**

CSC

APPLIED TECHNOLOGY DIVISION
2460 North Courtenay Parkway
Merritt Island, Florida 32952
An Equal Opportunity Employer: M/F/H

FLORIDA and ATLANTA PROGRAMMER/ANALYSTS
To $35,000 To Start

Two highly-respected Fortune 500 industrials have immediate need for Programmer/Analysts to develop New Data-Based MIS Systems and to add further Financial Applications later. To qualify, you'll have a BS/CS or equivalent degree, plus minimum 3 years Online IBM OS/COBOL developing Financial Applications under IMS, IDMS or TOTAL Data Base, and must demonstrate user-communication skills. (Service Industry and Conversion experience preferred but not necessary.) Both Companies actively promote from within, and are located in very popular life-style areas. Reply in confidence - 7 days a week - to (404) 355-1292

WENT MACKENZIE
4000 Winters Chapel Road (L-3)
Atlanta, GA 30350
Independent Consultant, Relocation and Client-Company Fees Paid.

CHICAGO
SYSTEM 34 & 36

If you have 2+ years experience on System 34 or System 36, we have some extraordinary clients interested in talking with you. RPG II and Cobol people are also welcome. Both management and analyst opportunities. $36,000

Contact:
Sandy Wells

ROBERT HALF OF CHICAGO, INC.
33 E. Wacker
Chicago, IL 60601
(312) 782-6020

MAINE

We have specialized in data processing professional placement in Maine for almost a fifth of a century. If you qualify for positions in the $25-40,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC.
477 Congress St.
Portland, Maine 04101
(207) 773-4746

SUNBELT

DP Mgr	FIN'L SOFTWARE	$33K
Prog LDR		
	BANKING TYMSHARE	$36K
Prog	COBOL/DOS	$25K
SYS PROG	IMS	$30K
PROG	COBOL or PL1	$30K
SYS PROG	CICS	$30K
PROJ MGR	MSA	$30K
PROG	NEAT 3/COBOL	$22K
SITE MGR	RJE/JCE IBM	$42K

ENGINEERS SHELF OF LOUISIANA, INC
4539 One Shell Square
New Orleans, La. 70139
(504) 524-3772

SYSTEMS SUPPORT SPECIALIST IV

The University of Georgia is seeking to fill the position of Systems Support Specialist IV which will be primarily concerned with job responsibilities in the area of microcomputers and minicomputers. The person accepted for this position will work in a very large computing environment encompassing the University of Georgia and the University System of Georgia Computer Network. Extensive experience in the areas of consulting, application design, and diverse usage of microcomputers and minicomputers in the educational environment is a highly desirable qualification. Serious inquiries should be directed to:

Director
Employments and Training Dept.
University of Georgia
Athens, Georgia 30602
(404) 542-3922

An Equal Opportunity Affirmative Action Institution

EDP OPPORTUNITIES

MGR-MVS, Sys Engr, staff 10	$52M++
DBA-IMS	$53M
P.L. 4341, CICS, VSAM/VS	$50M
P.L. Banking, deg. MVS	$53M
P.L. Fin'l Sys Dev, COBOL	$61M+
TIME-SHARING Sales, NY, NJ, Conn., Fla & Dallas	$33M+
MVS Sys Engr, ALP, MVS	$41M
P.L. Sys Dev, MBA, CICS	$51M+

Call Bill Borrelli (212) 349-3610
WM. HARRIS ASSOC.
100 Broadway agency NY, NY 10036

SEATTLE
PACIFIC NORTHWEST

IMS Database Mgr		$60,000+
IMS DB analyst	to	34,000
Proj Mgrs	to	40,000
CICS, heavy	to	38,000
CICS, 2+ yrs	to	30,000
Sys Prog, DOS	to	32,000
Wang VS SPEED	to	35,000
P/A RPG/Cobol	to	28,000

Call collect/send resume
206-453-0444
COMPUTER PERSONNEL INC
1 Lake Bellevue Drive
Bellevue, WA 98005

SYSTEM PROGRAMMER

Burroughs Large System Excellent Knowledge of DMS 2 and Teleprocessing.
Please send Curriculum-Vitae to:
Mr. Salard
IPSA
Cerro Tuers No. 27
Ontopulco-Universidad 04310
Coyoacan, Mexico City, D.F.
or call to:
Miss Lopez, 550-34-62 Mexico City from 7 p.m. to 9 p.m. (California Time)
Monday to Friday or Saturday from 9 a.m. to 1 p.m.

ANALYSTS/PROGRAMMERS

Excellent opportunities for qualified individuals to become associated with a well established scheduled airline based in Anchorage Alaska, operating in a 4331, DOS/VSE environment utilizing CICS command level COBOL.

The following positions are available: Systems Programmer, Systems Analyst, Programmer/Analyst and Programmer. We offer salaries commensurate with experience, excellent benefits including airline travel benefits. Send resume to Wien Air Alaska, 4100 International Airport Road, Anchorage Alaska, 99502.
EOE/AAP

The

NATIONAL COMPUTER CONFERENCE

The largest and most important computer conference is fast approaching—the National Computer Conference. This year it is going to be held in Houston June 7-10. COMPUTERWORLD will be issued at the show, bringing its readership to well over half a million. To get that kind of exposure for you and your company, plan now to advertise in our three NCC issues.

The open line rate for Classified Advertising is $6.95 per line. Send us either camera-ready material or copy to be typeset by us, along with any logos or borders to be used, and a layout, if desired. Ads may be sent in via the mail, by telecopier, or given over the phone to our team of ad takers. First-time advertisers must send payment along with their advertisement.

Our address is as follows:

Classified Advertising
Computerworld
Box 880
375 Cochituate Road
Framingham, MA 01701

If you need more information, please call us at 1-800-343-6474 or, in Massachusetts, (617) 879-0700.

The BEST TIME To Do Your Classified Advertising Is Coming Up.

The BEST PLACE To Advertise Is In COMPUTERWORLD'S NCC Issues.

NCC Preview Issue	**May 31**
Classified Closing	May 21
Color Close	May 14
NCC Issue	**June 7**
Classified Closing	May 27
Color Closing	May 21
NCC Wrap-Up Issue	**June 14**
Classified Closing	June 4
Color Closing	May 28

position announcements | position announcements | position announcements | position announcements | position announcements

DATA PROCESSING PROFESSIONALS

Marriott Corporation has career opportunities for high calibre, creative and energetic computer professionals. We are a results-oriented, mature DP department consisting of IBM 370-158 and IBM 3033 hardware. Consider these exciting and challenging opportunities:

SYSTEMS PROGRAMMING
• MVS/SP 1.1 • JES 2 • RMF
• SPF/PANVALET • TSO/SPF
• CMF

DATA COMMUNICATIONS
• ACF/NCP • ACF/VTAM
• NCCF • TCAM
• NPDA • 3705

DATA BASE (IMS DB/DC)
• Internals • DB Design & Installation
• Data Dictionary • Tuning

If you are a professional with training and experience and want a career you can build on, in a company as ambitious as you are, send resume

Marriott corporation

Marriott Drive
Attn: Bill Leisher
Dept. 996 01
Washington, DC 20058

An Equal Opportunity Employer M/F

SYMBOLIC DEBUGGING IN ADA*

One of today's most exciting developments in computer science is the Ada program, designed to provide software developers with an integrated, state-of-the-art programming environment based on the new DoD common language. At SofTech, we have played a leading role in the evolution of Ada, and are today in the forefront in developing production Ada systems.

SofTech is currently searching for an experienced candidate to design, document and implement a symbolic debugger for the Ada Programming Environment. Previous debugger implementation experience required. Familiarity with Ada preferred.

SofTech has immediate openings for Compiler and Tool Designers, Language Specialists and Course Developers, as well as specialists in all other phases of Software Engineering. We are a rapidly growing company with a reputation for excellence in the development and application of software technology. We are proud of the continuity of our staff and the national reputation of our key people.

We offer opportunities for professional growth inherent in a 400-person environment, coupled with excellent starting salaries and outstanding benefits. Please write to Judith M. Forsythe, Dept. 597, SofTech, Inc., 460 Totten Pond Road, Waltham, MA 02154, or call (617) 890-6900, or toll-free at 1-800-225-8854.

an affirmative action equal opportunity employer

*Ada is a trademark of the DoD (Ada Joint Program Office)

SOFTECH
THE SOFTWARE TECHNOLOGY COMPANY

SOFTWARE ENGINEERS

We are a dynamic Palo Alto based company that provides complete computer systems for the acquisition of data, control and management of information in distribution control environments such as electric power, water treatment and natural gas.

Software Engineers, if you have a B.S. degree and 2-5 years experience on real time data acquisition systems with a background in a Science or Engineering discipline, we need you to assist in the development of systems using the VMS operating system on Digital Equipment-VAX computers. **SPECIFICALLY VAX/VMS SYSTEMS PROGRAMMERS WITH KNOWLEDGE OF SYSTEMS PROGRAMS INTERNALS AND VAX HARDWARE IS REQUIRED.** In addition, a well rounded knowledge on DEC PDP-11 computers, systems integration exposure and the operation of RSX-11M operating systems for development of our turnkey systems is desirable.

This position offers an outstanding professional challenge and growth opportunity combined with an excellent salary and benefits plan. For immediate consideration please send, in confidence, your salary history and resume to: 444 Castro Street, suite 504, Mountain View, CA 94041. ATT: DEPT. TM. An equal opportunity employer.

DIRECTOR OF MARKETING

Rapidly Growing Computer Graphics Software Company

Position demands a top marketing professional with proven experience in the computer industry and possessing significant line management experience. Tech degree highly desirable. MBA a must. This company has committed a large share of revenue to marketing. We offer an exceptional opportunity to qualified individual with demonstrated ability in handling all aspects of the marketing mix. Past experience showing proven expertise in using sound marketing principles to positively impact demand for products and/or services is an absolute must. A wide open opportunity to attain personal professional growth in a city situated at the very base of the magnificent Rockies. In addition to becoming an integral part of our company, you can expect a very competitive compensation package. Please send resume, references, and other pertinent data in confidence to:

PRECISION VISUALS, INC.
250 Arapahoe Avenue
Boulder, CO 80302.

An equal opportunity employer.

PROGRAMMERS PROGRAMMER/ ANALYSTS

HARDWARE • SOFTWARE

If you have one or more years experience on any of the following:

- IBM 370 3033 4331 4341 8100 VM CMS CICS OS VSI MVS DOS VSE VSAM COBOL ASSEMBLER IMS
- HONEYWELL 6000 SYSTEMS LEVEL 6 66 40 DUAL IDS DM4 COBOL GCOS GMAP
- UNIVAC 1100 (EXEC 8) OR 90 SERIES (OS 3) OS 1100 OR OS 3 INTERNALS DMS 1100 TIP CMS QLP ASC 11 COBOL
- DEC PDP 11/23 34 44 45 70 VAX 11 780 RSX 11M K RSTS E VAX VMS MACRO 11, BASIC 2, FORTRAN ASSEMBLY LANGUAGE
- NCR 8550 8585 8200 VRX IMOS-STORE IV TRAN PRO NEAT 3/COBOL ON LINE SPECIAL NEED FOR CIF
- BURROUGHS 3890 4700 6700 6800 ALL SOFTWARE NEEDED

and would like the most individualized job search in data processing today on a company fee paid basis, nationally, send your resume in confidence to:

SOUTHERN COMPUTER SERVICES
P.O. DRAWER 2679
SARASOTA, FLORIDA 33578
Toll Free 1-800-237-6701

DATA BASE ADMINISTRATOR

As part of our constant expansion, we now need a DBA to manage our growing Data Base. Ours is a DOS/VSE, PL/1, DL/1, CICS installation with a national distributive processing network, planning to convert to MVS.

We are a fast growing distribution company with a nationwide market located in Harrison, Arkansas you will live in the heart of the beautiful Ozarks. We offer competitive salaries combined with an excellent benefit package.

Qualified candidates with have extensive experience with designing and controlling the DL/1 or IMS Data Base. Systems Programming experience in DOS or OS is helpful.

Send resume to:
John R. Berry
Personnel Manager
Mass Merchandisers
PO Box 790
Harrison, ARK 72601

No Agencies Please

Computer Instructors / Lab Assistants
needed for day and evening courses
Experts in COBOL, BAL, OS/JCL, teleprocessing, FORTRAN, systems analysis, programming techniques, or WYLBUR sought. BA/BS required
Additional information: Linda Nahum, 212-725-7172
Send resume and letter indicating courses for which you are competent to: Prof. John Trinkaus, Baruch College, 17 Lexington Avenue, Box 312, NYC 10010.

Baruch College
The City University of New York
An equal opportunity / affirmative action employer

Arizona/California/Texas/Colorado/Florida

SCIENTIFIC OR BUSINESS PROGRAMMERS

All fees and relocation paid. $20-40,000

If you have a BSEE, BSCS, BS in Mathematics or Physics or equivalent, we need you right now.
For Business: OS/DOS/IMS/CICS/MVS/JES Prog/Anal/Systems/Data Base. All large scale installations.
For Scientific: experience in the computer, communications, semiconductor, or aerospace/defense industries.
Your name, resume, and present employer will not be given out without your permission.
For sincere personal service, please send a confidential resume to:
Don Pullman (602) 274-5800
PULLMAN PERSONNEL
3033 North Central Ave. Suite 401, Phoenix, Arizona 85012

position announcements | position announcements | position announcements | position announcements | position announcements

Raynolds Electrical & Engineering Co., Inc., has immediate openings available in Las Vegas, Nevada.

COMPUTER PROGRAMMER/ANALYST

We have immediate openings for experienced programmers who have any combination of training and experience equivalent to a Bachelor's Degree in Business Administration, Mathematics, Engineering, Computer Science or related fields. Experience requirements include one year or more on any of the following — COBOL on large time sharing systems, DEC computers, FORTRAN and DEC MACRO programming.

EQUAL OPPORTUNITY EMPLOYER - M/F

Liberal Fringe Benefits
Must be a U.S. citizen
Replies held confidential

Send resumes to:
Trudie L. Rainey
Employment Section Chief
Reynolds Electrical & Engineering Co., Inc.
Post Office Box 14400
Las Vegas, NV 89114

F-O-R-T-U-N-E OF SEATTLE, INC.

Sr Sys Prog 40K
Major firm relocating, needs high level indiv to take charge immed growth potential Large IBM, MVS, TSO ACF/NCP/VTAM Data Base, Acct/Fin systems a plus.

Proj Lead 32K
5 yrs banking exp, trust or fin systems, Large IBM, COBOL, JCL, IMS, strong interpersonal skills.

Data Base Analyst 30K
IBM mid-large mainframe, IMS DB/DC, DL/1, CICS, DD DB Admin a plus.

Prog/Anal 26K
IBM COBOL, IMS, Acct/Fin systems

Positions at all levels in the beautiful Pacific States and Nationwide

2200 6th Avenue, Suite 539
Seattle, WA 98121
(206) 682-0911
Exclusively Employer Fee Paid.

MAIL ORDER PROGRAMMING

West Coast Programmer/Analysts Earn $250/more per week, code - debug - prepare test data. Homework assignments bring fast extra dollars, a few hours a day, 3-4 days per week, all by mail. Quick, easy to learn our standardized procedures, start immediately, earnings are guaranteed. Send current resume and self-addressed, stamped envelope to:

SSA/CODEMAIL
18040 Sherman Way, Ste. 521
Reseda, CA 91335

LOOKING FOR A CHALLENGE IN A DYNAMIC ORGANIZATION WHERE THERE'S NEVER A DULL MOMENT

IBM MVS SYSTEMS PROGRAMMER
25K - 40K

- MVS/JES2 Internals
- MVS Diagnostics
- System Generation
- Capacity Planning
- IMS DB/DC
- Proprietary Products Installation

Applicants must have at least one year a system programming experience. Submit resume or SF 171 to Ermer Lowe, Staffing Specialist, EOM Personnel Unit, Deanct Building, Room 218 1350 E Street, N.W. Washington, D.C. 20004

DISTRICT OF COLUMBIA RESIDENCY NOT REQUIRED

SENIOR SYSTEMS ANALYST

Hands-on experience with WANG Super Payroll/Personnel required. Supervise maintenance and development of mini-computer systems.
Rapidly growing company, professional environment, good compensation package.

AMERIFIRST FEDERAL SAVINGS
1 Southeast 3rd Ave.
Miami, FL 33131
Tel.(305)577-6520
EOE

PROGRAMMER RPG II

Move ahead with this large mir 5 you have 3+ years RPG 5 on System 34 MAPICS applications a definite plus. Superb benefits and relo package. To $30K.

ROBERT HALF OF OKLAHOMA, INC
5640 So. Memorial Dr. Suite 217
Tulsa, OK 74145
(918) 627-1600

ASSISTANT D.P. DIRECTOR

Assistant D.P. Director for challenging position in a growing company. Requires effective communications and organizational skills and demonstrated success in the management of applications development.
Respond in confidence to:

THE BOND BUYER
Dept. ADP-CW
1 State St. Plaza
New York, NY 10004

TEACHING OPPORTUNITY

Teach at Frostburg State College in the beautiful mountains of Western Maryland with excellent recreational facilities. Ideal family location. Good schools, excellent medical facilities, drive to three metropolitan centers. Duties include teaching upper level and introductory courses in Computer Science. Master's degree required. Teaching or industrial experience preferred. Apply by July 1 to Carl F. Stemmer, Computer Science Department, Frostburg State College, Frostburg, Maryland 21532. AA/EO Employer.

SOFTWARE INSTRUCTOR

Artificial Intelligence Corporation has developed and markets INTELLECT, the *only* natural English Database Retrieval System.
AIC seeks a highly qualified professional for course presentation to customer personnel. In addition to teaching and business experience, the position requires 2 years' application and database experience in an interactive IBM environment.
Please send resume to
Nancy Driscoll
Artificial Intelligence Corp.
289 Fifth Avenue, Waltham, MA 02254

DESIGN ENGINEER (ELECTRONIC)

To design electronic circuits and software for computers and computer-related equipment. Must have B.S. in electrical engineering and one year of experience. Forty hours per week, 8 a.m. to 5 p.m.. Annual salary $25,000.
Apply with Resume to:

MRS. BEAL
Ohio Bureau of Employment Services
150 East Market St.
Akron, OH 44308

County Government looking for experienced SYSTEMS ANALYST to plan, develop, and maintain a Police Computerized Information Systems. Permanent position in County's Service.

For information call (703) 558-2167 or write to:

Arlington County Personnel Department
2100 14th Street, North
Arlington, Virginia 22201.

INSURANCE D.P.

Take your pick! Our client companies in central Massachusetts presently have several immediate openings including Project Leader, Senior Systems Analyst, and Lead Programmer/Analyst, just to name a few. Mainframe IBM OS/MVS, COBOL, and Data Base/Data Communications environments. Fully paid relocation. Salaries in excess of $40K. For more details call or send resume to Jay Scully.

Dunhill
of Worcester Inc.
370 Main St. Ste.730
Worcester, Ma. 01608
(617)755-0110

Computer and Information Science position opening Fall, 1982 at Bloomsburg State College. Qualifications: Graduate degree (earned doctorate and CDP preferred) in computer or business field. Some experience in commercial/financial applications or other computer applications. Teaching experience desired. Rank: (Assistant or Associate Prof.) and salary commensurate with qualifications. Contact: Dr. Frederick L. Stenz, School of Business, Bloomsburg State College, Bloomsburg, PA 17815, by May 15, 1982.

An Affirmative Action/
Equal Opportunity Employer

COMPUTERWORLD CLASSIFIEDS WORK!

- POSITION ANNOUNCEMENTS
- BUY SELL SWAP
- SOFTWARE
- TIME & SERVICES
- SOFTWARE FOR SALE
- REAL ESTATE
- BUSINESS OPPORTUNITIES

It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or a camera ready mechanical, stat or film negative of your ad, just call one of our ad-takers at 1-800-343-6474. They will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (telecopier service is available): note the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with your insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

Ad closing is every Friday, 6 working days prior to issue date.

Rates: Open rate is $97.30 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs $194.60 per insertion. Additional space is available in half-inch increments. Some sample sizes and costs are shown.

1 col x 4" — $389.20
2 cols x 4" — $778.40
2 cols x 5" — $973.00
2 cols x 8" — $1556.80

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld.
Box Numbers are available. $10 per insertion.
Ad Closing is every Friday, 6 working days prior to issue date (issues are dated Monday)

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

Boston - (617) 879-0700
New York - (201) 967-1350
Chicago - (312) 827-4433
San Francisco - (415) 421-7330
Los Angeles - (714)556-6480
TELECOPIER SERVICE - (617) 879-0700

William J. Mills, Manager Classified Advertising

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

BUY SELL SWAP

DPD PERIPHERALS

3330 3410
3340 3411
3350 3420

BUY • SELL • LEASE

COMPUTER BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TENNESSEE

CB

901-372-2622

GSD SYSTEMS

3 32
34 38

BUY • SELL • LEASE

ASCD MEMBER AMERICAN SOCIETY OF DIGITAL DEALERS

DEC

SYSTEMS • COMPONENTS

SYSTEMS • CONFIGURED
11/44 • 11/34 • 11/70

DISK DRIVES
RP06 • RJM02 • RM02 • RM03 • RK07PA & EA.

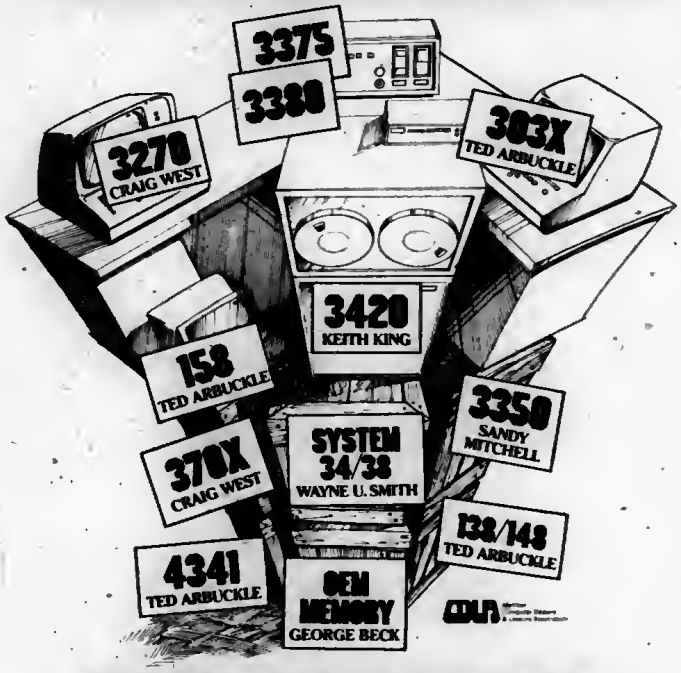
TAPE DRIVES
TWE16 • TS11 • TU10

MEMORY + OPTIONS
MK11CE & BE • MJ11BA & BE
DZ11A • FP11C

H.L.S., INC.
COMPUTER SUPPLIERS SINCE 1972
(714) 840-1393
16400 PACIFIC COAST HIGHWAY #219
HUNTINGTON BEACH, CA 92649

IBM
3270

THE HARDWAREHOUSE IS HARD TO BEAT FOR PRICE AND AVAILABILITY.



CALL US TODAY AT (602) 248-6848, PHOENIX, ARIZONA
OR CALL OUR LOCAL OFFICE IN YOUR AREA

Boston: Eastern Regional Headquarters (617) 272-8110
Washington, D.C. (703) 521-0300
New York (212) 832-2622
Philadelphia (215) 293-0546
Syracuse (315) 682-6120

San Francisco: Western Regional Headquarters (415) 283-8980
Los Angeles (213) 670-7994
Denver (303) 534-7436
San Diego (714) 231-2361
Seattle (206) 447-1682
Phoenix (602) 248-5978
Portland (503) 228-7033

Chicago: Central Regional Headquarters (312) 789-9100
Pittsburgh (412) 922-8920
Ann Arbor (313) 995-8717

Austin: Southern Regional Headquarters (512) 451-0121
Atlanta (404) 768-6535
Dallas (214) 233-1818
Houston (713) 629-4440

Canada: Toronto (416) 366-1513
Montreal (514) 281-1925

GREYHOUND COMPUTER CORPORATION
SUBSIDIARY OF THE GREYHOUND CORPORATION

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

DEC INVENTORY

SMS-FWD0101 LSI-11 Winchester/Floppy Controller	$1,295.
VT100 (Used)	$995.
KDF11-AA	$1350.
MSV11-DD	$330.
MXV11-AC	$300.
KPV11-B	$310.
DRV11	$185.
Data Royal Printers 136 COL IPS-5000A with options	$1,175.
Shugart Drives SA851R DBL Sided/Density 1MB Floppy	$495.
SA1004 8 Inch 10MB Winchester	$1,095.
Quantum Winchester Drives Q2040 40MB	$2,795
Summagraphics Bit Pads 11x11 RS232	$559.

This is Excess Inventory in original cartons and under warantee.

(617) 893-6390
Ask for Steve

IPS Computer Marketing Corp.

TELEPHONE: (201) 262-9500 Telex: 642-197

DAO Series/1

BUY - SELL

4952-B
4955-D
4955-E
4962-2-2F, 3-4
4974
4975
4978

Contact:
Ray Audette
DATA AUTOMATION COMPANY, INC.
4828 CASH ROAD DALLAS, TEXAS 75247
214-637-6670

OFFSHORE KEYPUNCHING

- Long Established Resource
- High Volume Capacity
- Courier Turnaround
- Competitive Costs
- References Available

Representatives visiting United States May/June 1982, wish to contact potential agents able to supply volume data on regular basis. All assistance given to establish required procedures and functions to operate successfully and profitably.

Interested parties should advise by telex or airmail in first instance, when contact will be made to arrange date for initial visit and discussion.

Tony Koh, Managing Director,
Computer Data International Pte. Ltd.
7c-9c Block 2, JTC Building Tee Peych North
SINGAPORE 1231. TELEX 23828 (KEYDATA) PHONE: 256 3293

BY AIRMAIL

We are interested to discuss Offshore Keypunching and wish you to contact us to advise the date of your visit.

Co. Name .....

Name of Contact .....

Telex ..... Phone .....

Address .....

.....

Out Interest: End User ☐ Agent ☐

NEW USED.

"WE WILL NOT BE UNDERSOLD"

TERMINALS, CRT's, PRINTERS

ADDS	NEC
DEC	QUME
DIABLO	TELEVIDEO
HAZELTINE	TEXAS INSTRUMENTS

Specialists In All DEC And Data General Systems And Components

SPECIALS

Diablo 630KSR's (New)	$2,395
VT100AA (Used)	$999
NEC 7710's (New)	$2,365
LA120AA (New)	$1,975
VT100AA's (New)	$1,375
VT131AA (New)	$1,499

Qume, Adds, TI (All) To 25% Disc.

The Computer Bank
315 Walt Whitman Road
Hunt. Sta. New York, NY 11746
516-549-5500

H-P 3000 - $ 100,000.00

Complete System For Sale

HP3000 II - 512KB - 2640B Console
4-7920 Disc Drives 50MB
1-7925 Disc Drive 120MB
1-7970E Tape Drive 1600BPI
1-2893 80 Col Card Reader 400CPM
2-2613A 300LPM Printers/with Controllers
10-2640B CRT Terminals/with Enhancements
2-#30032OB Asynchronous Terminal Controllers (32 ports)
5-2621A CRT Terminals
14-XEROX 1700 30CPS Printing Terminals

Accessory Equipment for Data Center: Tapes, Cabinets, Bursters, Desks, Chairs, Decollators, Etc. Available at Bargain Prices.

AVAILABLE IMMEDIATELY

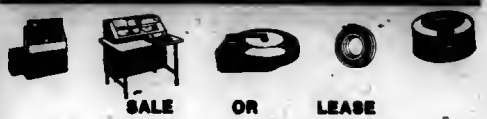
UNITAB COMPANY OF ABILENE
P.O. BOX 2489
ABILENE, TEXAS 79604
ATTN: B. JACK WILLIAMS 915/673-3779

BUY SELL LEASE
Series 1
Peripherals & Features

BEDFORD COMPUTER MARKETING INC
4141A Greenbriar
Stafford TX 77477
Tel (713)981-8757

IBM UNIT RECORD EQUIPMENT

DISK PACKS DATA MODULES, MAG TAPE DISKETTES



SALE OR LEASE

026	084	129	548	2316
029	085	514	555	3336(1)
082	087	516	3742	3336(11)
083	088	526	360/20	3348(70) Cartridges

Highest prices paid for used packs & machines.

Thomas Computer Corporation
600 North McClurg Court, Chicago, IL 60611
800-621-3808 IL 312-944-1401

Authorized Distributor Memorex CDC 3M BASF

Buy - Sell - Lease

3741/3742

Short-Term Leases — All Models — Printers

S/34 S/32 S/38

Call: Steve Hough or Dick Geyer

Computer Marketing of America, Inc.
CMA
P.O. Box 90907
422 Acklen Park Drive
Nashville, Tennessee 37209

Call Toll Free
1-800-251-2670
In Tennessee: 615-297-7516

PRIME COMPUTER USERS

New 80 and 300 megabyte drives Available for immediate delivery.
300/1440 LPM Printers also available.
Nationwide CDC maintenance and financing.

Call Barry Dacks
Timesharing Services Inc.
(904)398-7068

DEC

- We Buy & Sell DEC Systems
- Wide Range of DEC Options, Peripherals, etc.
- Immediate Delivery on In-Stock Equipment
- Low Prices
- Guaranteed for DEC Maintenance

CALL TODAY (612) 894-4020

MSI MIDWEST SYSTEMS INC

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

BUY • SELL • LEASE

TAPE
3411•3410
3420
DISK
3340•3344
3350

Call Bob Ford
or Nelson Johnson

S/3
ALL MODELS
(8, 10, 12, 15)
S/32
S/34
SERIES/1

Call Gayle Drotar
Roger Odom
Ken Winzen

370 Systems
(Models 115-138)
4331

Call Donna Sage

370 Systems
(Models 145-168)
4341
3031•3032
3033•3081

Call Jack Harvey

Want our capabilities brochure? Send us your business card.

ECONOCOM
1755 Lynnfield Road
P.O. Box 17625
Memphis, Tennessee 38117
901-767-9130

CDLA

Series/1
BUY–SELL–LEASE
CPU's—4952 & 4955
Disk—4962's/4963's
Printers—4973's/4974's
Displays—3101(Model 23)/4978/4979
Features—Most Available

We maintain an inventory of Series/1 Hardware. Most items can be shipped immediately.

CALL ROGER ODOM
901-767-9130

ECONOCOM
P. O. Box 17625 / 1755 Lynnfield Road
Memphis, Tennessee 38117-0625

CDLA

COMDISCO

Your First Choice ✓
In The Second Market

IBM PROCESSORS
- ☐ 3081
- ☐ 3033
- ☐ 3032
- ☐ 3031
- ☐ 4341
- ☐ 4331
- ☐ 3168
- ☐ 3158
- ☐ 3148
- ☐ 3138
- ☐ Amdahl

IBM PERIPHERALS
- ☐ 3880 3830
- ☐ 3350 3370
- ☐ 3375 3380
- ☐ 3333 3330
- ☐ 3340 44
- ☐ 3803 3420

MISCELLANEOUS
- ☐ Memory Channels
- ☐ 3705/04
- ☐ 327X

We Can Put It Together

A MEMBER OF THE NEW YORK STOCK EXCHANGE

COMPUCOM

BUY-SELL-TRADE

CPU • PERIPH • PDP11
CRTS • DECSYS • AND
AND COMPONENTS

COMPUCOM INC.
3404 OAKCLIFF RD., C-4 ATLANTA, GEORGIA 30340
(404) 452-1090/TWX 810-757-0202

L1-M2
4341 N2 & P2
7/16/82 & 8/13/82
4331-K2
June - 1982

DASD
3370-3375
Immediate Delivery

Tape Drives
3420
3410 8809
Immediate Delivery

Controllers
3880 3830
3803
Immediate Delivery

Printers
3203 1403
3287
Immediate Delivery

DASD
3350 3344
3340 3330 3310
Immediate Delivery

Control Units
3274 3272
3276 3271
Immediate Delivery

Display Stations
3278 3277
Immediate Delivery

CDLA
Computer Marketing Inc

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

EQUIPMENT AVAILABLE

Delivery Positions

Qty.	Machine Type	Model	Available
1	3375	A01	4/23/82
3	3375	B02	4/23/82
1	4341	L02	5/21/82

Description	For Sale/Lease	Date
	370/168	
168 - U04 (2150, 2151, 3855, 4850, 6111, 7850, 7905, 3066-2 and 3067-3)	lease only	now
168 - U02 (2150, 2151, 2152, 3623, 3855, 4850, 6111, 7850, 3066-2, 3067-3, 2870-1, 3-2880's)	lease only	now
168 - KJ (1435, 3855, 3066-2, 3067-2, 2-2870's, 3-2880's)	lease only	now
	370/158	
158 - U35 (1433, 1434, 1435, 7840, 3213-1)	lease only	now
158 - K (1433, 1434, 1435, 7840, 3213-1)	sale or lease	now

Contact: Jack Northrop
Lease Financing Corporation
3 Radnor Corporate Center
100 Matsonford Road
Radnor, Pa. 19087
215/527-4450

LFC — Member Computer Owners & Lessors Association

SERIES/1

FRONTIER

WANTED!

SYSTEM/32 **SYSTEM/34**

If you have a System/32 or System/34 to sell, we would like to buy it. Since we are dealing on behalf of already committed buyers, we can afford to pay top dollar for your computer.

CONTACT
Mr. William Bell
National Medical Computer Services, Inc.
7578 Trade Street
San Diego Ca. 92121
(714) 566-9920

SYSTEMS • PERIPHERALS • PARTS

DG | DEC

NEW PHONE NUMBERS

Phil Thomas 305-392-2006
Bryan Eustace 305-392-2005
Jennifer Eustace 305-392-2007

TELEX 807-219

BUY-SELL-TRADE-LEASE

THOMAS BUSINESS SYSTEMS, INC.

HEWLETT PACKARD

3000 SERIES
Most Common Configurations
Memory, Disk & Tape Subsystems, Terminals, I/O Accessories, Processors & Printers

1000 SERIES
21MX & 21MXE Series Systems In Stock
Same Day Shipments On Memory Disc & Tape Drives

Buyers of all H.P. Surplus And Obsolete Systems and Parts
Call Us For An Immediate Quotation.

ABS
AIRBORNE DATA SYSTEMS
1112 Wrigley Way • Milpitas, CA 95035
(408) 262-5137

BUY • SELL

HEWLETT PACKARD

1000 SERIES
AND ALL HP PERIPHERALS

CALL:
encor*e
213-393-4932

IBM Computer Cables FAST!

CABLE xpress

(315) 476-3000

Sale Or Lease

AP For 3033

3042, 3036, 3037, 3038
3081-K32 (7/82)
3271-02, 3277-02
3333-01, 3330-01
3330-11
Call Tom Clack
Transcomp Leasing Company
12900 Preston Road
Dallas, TX 75230
(214) 661-3900

BUY·SELL·LEASE·TRADE

PURCHASE LEASEBACK RENTAL CREDITS

SYSTEM 32's, 34's

4300's All Peripherals

360's All Peripherals and I/O

370's All Peripherals and I/O

3270's CRTS, Printers & Controllers

MCC

(214) 258-0541
TWX 910-860-6285
METROPLEX COMPUTER COMPANY, INC.
300 Decker Dr., Suite 100
Irving, Texas 75062
Dedicated to Service With Integrity
MEMBER ECCA

BUY, SELL, LEASE

4300's, S/3, S/1 S/38, S/34, S/32

DANA MARKETING INC

FOR IMMEDIATE LEASE

3033 U12

3031 4 or 6 megs

370/158 U35, 5 channels, ISC, Madrids

Call Dwayne M Dahl at (203) 834-1105
Or write him at 206 Danbury Road Wilton, CT 06897

General Electric Credit Corporation

We buy, sell and lease new and used computers

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

FOR SALE OR LEASE

IBM COMMUNICATIONS CONTROLLERS

3704

A01-A04

3705

MODELS E, F, G, J

ANY CONFIGURATION

AVAILABLE IMMEDIATELY

Call 800-528-6113
Craig Alan West

GREYHOUND COMPUTER CORPORATION

HAVE YOU HEARD THAT

MEADOWLARK ENTERPRISES

Buys and sells warranteed new or used DEC equipment at the best prices. Find out for yourself why people do business with Meadowlark.

Call:
617 777-4666

For all your DEC requirements 11/70, VAX 11/44, 11/24, 11/23, 11/34

WHEN IS THE BEST TIME TO TALK TO RANDOLPH ABOUT LEASING A 3081?

Probably yesterday. And the sooner the better. But it's never too late, even if you have a machine installed. Talk to Randolph now . . . we can solve problems like these . . .
Long wait for delivery?
Stuck with a lease on your old machine?
Own a 3081 but need cash?
Machine installed on rental basis?

GET THE 3081 YOU NEED NOW . . . NOW.

Whatever your problem, we can tailor a lease that will fit your exact needs and let you start saving money right away.

SAVE $80,000 EVERY MONTH FOR THE NEXT 5 YEARS.

You can lease the same 3081 that IBM rents for $180,000 per month from Randolph for less than $100,000 per month. If you're renting an older machine, we can save you even more—and you'll get about 4 times the throughput in the bargain.

LEASING COMPUTERS IS OUR ONLY BUSINESS.

At Randolph, our people have an average of 18 years in the DP industry . . . from 360's to 3081's. They know all about alternative financing to be sure, but they also know their way around a DP department and the hardware in it.

WE LEASE MORE THAN 3081's.

Whatever your needs, now is the time to talk to Randolph. We provide leases for IBM 303X, 4300 systems and peripherals—disks, tapes—as well as 3081's.

UNIQUE FINANCIAL STABILITY.

We're an important part of one of the nation's oldest and leading banking institutions. The First National Bank of Boston. 18 years in computer leasing gives added assurance that Randolph will continue as the leader in the computer leasing industry . . . continue to live up to the terms and conditions of our agreements . . . provide upgrades . . . fulfill all of our commitments.

TALK TO RANDOLPH NOW.

We can solve a lot of problems for you . . . call Joseph B. Kelly, Jr., Senior Vice President

537 Steamboat Road
Greenwich, Connecticut 06830
203 661-4200 • 800 243-5307

Randolph

A MEMBER OF COMPUTER DEALERS & LESSORS ASSOCIATION RANDOLPH COMPUTER COMPANY A subsidiary of BANK of BOSTON THE FIRST NATIONAL BANK OF BOSTON

WANTED

4331's/4341's

ALL MODELS

and all 370 CPU's and peripherals

10237 Yellow Circle Drive
Minnetonka, Minnesota
55343
612/933-6000
Ursula or Dale

CDLA Member Computer Dealers & Lessors Association

IBM

PROCESSORS
PERIPHERALS
- BUY
- SELL
- LEASE

Carlyn Computer Systems, Inc.
5203 Leesburg Pike, Suite 1204
Falls Church, Virginia 22041
Call Collect (703) 820-3754

Computer Sales & Leasing

SYSTEM 38•34•32•3

5110•5120

SERIES 1

5251	3262
5256	3287
5211	3278
3344	3741
3411	3410
3340	029/129

CCSI

IBM

SERIES 1 S/32 S/34 S/38
TAPE DISK PERIPHERALS
UNIT RECORD 029-129
5110-5120 3741 3742

Amertax Computer Corporation

214-934-9151
GENE NICHOLL TOM KLEERSCH
14229 PROTON • DALLAS, TEXAS 75234

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

3380-AA4/B4
3880-2/3
60 Day Delivery

3350 3370
3375
Immediate Delivery

Sale or Lease

Contact Your Local Office

Atlanta	404—256-5956	Florida	305—428-3177
Boston	617—542-4005	Ft. Worth	817—534-1774
Chicago	312—698-3000	Michigan	313—644-1500
Connecticut	203—655-1211	New Jersey	201—568-9666
Dallas	214—258-6444	San Francisco	415—944-1111
	Washington, D.C.	301—441-1000	

COMDISCO

FOR LEASE ONLY

SYSTEM/34-F35

COMPLETE SYSTEM
Available May 1
214/258-0541

MCC METROPLEX COMPUTER COMPANY, INC.
320 Decker Drive • Suite 160 • Irving, TX 75062 TWX 910-860-5265

→ NCR USERS
Are You Thinking of Trading Up ↑? or Down ↓?
Call Us for a Quote
SMITH ANDERSON CORP.
714-340-6686
Authorized NCR Systems Distributor - Nationwide
(New or Used Systems)
71-886 Highway 111
Rancho Mirage, Calif. 92270

IBM SYSTEM 34

WILLIAM MARION COMPANY, INC.
P.O. BOX 309, HACKENSACK, N.J. 07602

DEC SWA South West Automation DEC
BUY, SELL, LEASE, TRADE
11/03-23-24-34-44-70
Systems-Peripherals-Modules
Maintenance-On Call Or Contract
Time Sharing, A/P, A/R, GL, INV, Payroll, WP
11381 Meadowglen, Suite E
Houston, TX 77082
(713) 497-4467

DEC
SALES ★ LEASING ★ RENTALS
IMMEDIATE DELIVERY

Upgrading?
MEMORY
IBM & OEM
CDLR
Centron-DPL Company

Data General

LOOK LOOK LOOK
WHAT'S BETTER THAN SEX?
ANSWER: SAVING $MONEYS'
$4843, $3700
COST PLUS
SDLC,
YOU CAN SAVE $MONEYS
CALL GEORGE SCOTT OR JIM TAYLOR
(806)763-8011

FOR SALE - BY SEALED BID

IBM 3033-U8

AVAILABLE JUNE 10,1982
BIDS DUE APRIL 26,1982

Request for an invitation to bid, or for inspection of equipment or other information, should be directed to:

MR. C.W. NASPINSKY
Dept. of Purchasing Services
The Pennsylvania State University
Tel.(814)865-5417

We Buy & Sell
DEC
Systems
Components
Digital Computer Resale
call:713 445-0062
6500 Kenkirk Ste C32
Houston, Tx 77060

For Sale or Lease Transfer

XEROX MP-560 = 2 CPU's/256K words of 32-bit memory

- 4 – 2.86 MB head/track RAD's
- 8 – 100 MB removable disc drives
- 2 dual-density, 9-track tape drives
- 1 triple density, 7-track tape drive
- 2 KSR operator consoles
- 1 card reader
- 1 card punch, paper tape reader, paper tape punch
- 2 procedure oriented data set controllers
- 2 medium-speed line printers
- Maintained by Honeywell
- Honeywell Level 6/36 minicomputer with 32K words or memory and 14 multiple line processors for 88 asynchronous terminal communication lines.

For terms and availability Contact: Bill Saunders • Motorola Government Electronics Group • P.O. Box 1417 • Scottsdale, AZ 85252 • 602/949-3000

3081-K
3350's
(213) 986-4830

Wanted to Purchase
Prime 400
Minimum Memory 512KB
96MB Disks with Controller
Minimum 16 Terminal Controller
Must be Eligible
for Factory Maintenance
Niskayuna Central Schools
Van Antwerp Road
Schenectady, NY 12309
(518) 382-2603

FOR SALE
DEC 11/34-357A-AA
System

256KB Mos Memory, KY11-LB Console, (2) RK05 Disk Drives/Controller, (10) VT52 Terminals with Interface, M7850 Perky Contrl, CTS-300 Software License, DZ11-A 8 Line Multiplexer, LA36 Printer, LP04 Printer. The system has been on Dec maintenance since new. Will sell some peripherals separately.

Call:
(617) 272-5610, Ext. 13

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

CMI

AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET

3042 AP for Rent Short Term Leases

3033-U12 Short Term Leases

SYSTEM 3 Models 12 and 15 Dennis Pennington

Ask about our 4300 Lease Plan

4341-M2 Sale or Lease Balance Sheet Relief

Communications IBM 3705 IBM 3704 Pat Ducey

ZBM Mary Drangin Immediate Delivery Tim Ryan

Buy/Sell/Lease Pat Catalano Mary Drangin

3270

SYSTEM 34 SYSTEM 32 Dennis Pennington

CMI CORPORATION

TWX TELEX 810 2[illegible] 1667 CMI CORP TRMI

(313) 362-1000

MARKETING
California (408) 773-1640 (415) 956-3183 (714) 752-8443
New Jersey (609) 645-7282
Tennessee (615) 449-6633
Texas (214) 385-0806
Montreal, Quebec (514) 871-1121
Paris, France Telex: 613910 CMI FR
Windsor, Ontario (519) 258-8910

CMI FINANCIAL SERVICES, INC.
755 W Big Beaver Troy, Mich 48084
(313) 362-1000

Member CDLA

DEC VALUES

11/70 Core Memory, MJ 11 BE-BA
11/44 MOS Memory 256KB, MS11-MB
11/70 CPU, ½ Megabyte
PDP-11 Network Link, DMC-11 (Local or Remote)
Unibus Controller, RH-11
PDP-11 8 Line Mux, 20 MA DZ11-C
11/60 MOS Memory 64KB, MS11-KE
PDP-11 Sync Interface, EIA, DU11-DA
PDP-11 16 Line Programmable MUX, DH11-AD

NATIONAL COMPUTER EXCHANGE

800-854-7224

6980 Aragon Circle, Suite 5 • Buena Park, CA 90620

(In Calif.)714-522-1870 TWX:910-596-1499

BUY SELL

IBM

SERIES/1
5110-5120
S/32
S/34
S/38
S/3

ALL MODELS
SYSTEMS AND PERIPHERALS AVAILABLE NOW!

(408) 425-7333

SOURCE DATA PRODUCTS, INC

INVENTORY SPECIALS

ASK FOR OUR DEC CATALOG

(916) 635-9340

WEX West Coast Computer Exchange Inc

DATA GENERAL

Hanson Data Systems

Independent wang Specialists

•WORD PROCESSORS
•COMPUTER SYSTEMS
•PERIPHERALS
•UPGRADES
•COMPATIBLES

BOUGHT & SOLD

CFR Associates, Inc.

617/372-8536

DEC EQUIPMENT FOR SALE

DISCS	PROCESSORS	TAPES	MEMORY
RP06-AA	11/70	TE16	MK11
RP06-BA	11/34A	TE10	MS11
RP04	11/40	TU45	MF11
RPR02	11/45	TU70B 50hz	MS780
RM03	OPTIONS	CABINETS	MISC
RM02	FP11	H967	PDT-110
RK05,06,07	KK11-A	H960	LA180
RL01,02	DZ11	BA11	CTS11-KM
	DH11	H9602	LA34-DA

Carl R. Boehme & Assoc., Inc.
Specialists in Digital Engineering

408/727-2686 Telex 172337

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

DEC EQUIPMENT — IN STOCK

DEC SYSTEMS

- 11/34: 256KB MOS, LA36, RL11-AK, DUP11-DA, DZ11-A, (2) RK07-EA, DD11-CK, RSX11-M license only — $35,500
- 11/44: 256KB MOS, RJM02-AA, LA120, TS11-CA, (2) RM02, DZ11-E, DD11-CK, RSX11-M license only — $87,000
- 2020's: various configurations — below list

DEC MIXED VENDOR SYSTEMS

- Configured to your specifications (Emulex, Plessey, CDC, Able, Kennedy, Mostek)

INSTALLATION — WARRANTY — MAINTENANCE

For more information call:

West Coast	Central U.S.	East Coast
Joe Monahan	Mike Forde	Dick Duval
415/794-2538	713/890-0923	301/459-8363

TYMSHARE

COMPUTER SYSTEMS & SUPPORT DIVISION

S/3-15D

IBM Sell Buy Lease

SERIES/1

Call Collect:
404-252-7480 5110

S/32

S/34

DATAMARC
6065 Roswell Rd.
Suite 320
Atlanta, GA 30328

DATA GENERAL CS70

- 384 KB
- 6061, 6060, 6026
- (7) CRT's, 300lpm
- 6 months old
- 35% off list

MIDWEST COMPUTER ASSOC.
Tel.(217)442-4371

For Sale Or Lease

COLA

Prime 300

Make us an offer
Includes: 448KB-D Memory
2-12MB Disks with Controller
8 Line AMLC with Cables
Under Contract Maintenance Agreement
Will sell as unit with software or as components

Niskayuna Central Schools
Van Antwerp Road
Schenectady, NY 12309
(518) 382-2003

Available Now

11/44

30% OFF

Quodata

For Sale Qantel 970

2 CRT's,

Contact:
Mr. Don Strauch III
(602) 834-4686

SAVE BIG $$$

★ All offers considered!
★ All items will be sold below market value!

IBM SERIES/1
Guaranteed for IBM maintenance

MODEL	MEMORY	DISK	COMMUNICATIONS	QTY.
4955E	256K	64M	Single line BSC	2
4955E	96K	15M	Single line BSC	1
4953D	64K	9M	Single line BSS	2
4952B	96K	15M	Single line BSC	12

AVAILABLE PERIPHERALS

ITEM	MANUFACTURER	MODEL	QTY.
CRTS	Televideo	912B	125
Printers	Texas Instruments	810RD	25
	Centronics	781	95
	IBM	4973	1
TTY Boards	MDB Systems	TTY-RS232	175
ML III Controller	IBM	2095	13
ML III Adapter	IBM	2096	26
TTY Adapter	IBM	7850	6

For Sale by Owner
Immediate Availability

CONTACT:
John Rogers (718) 674-0700

FOR SALE H-P 9830 SYSTEM

(1) 9830A 16 kb memory and ROMS
(1) 9830B 32 kb memory and ROMS
(2) 9866A Thermal Printers
(2) 9867B Mass memory drives, with power supplies and Controller
(1) 9866A Card reader, with Select Hopper
(1) 2607A 200 LPM Line printer
(1) TAB/510 Keypunch (punch/verifier)

All H-P hardware presently under service contract, fully maintained and certified by Hewlett-Packard.

MAKE AN OFFER FOR ALL OR PART
Call: Curt Neitzel
(313) 371-1012

INVENTORY CLEARANCE
From Stock

CDC* 9766

300 Megabyte Drives

- New in Manufacturer's Box
- Controllers Available

$11,500

Call Ann

714-632-6925

DEC PDP 11/45 SYSTEM

Immediate Availability
For complete details on all system components and pricing, Please Call or Write To:

Susan Wolanskid, Purchasing Manager
Capital Markets Sources Inc.
5 Hanover Square
New York, NY 10004
(212)635-2916

For Sale PERKIN ELMER COMPUTER

8/16E 192K
4 terminals
Disk, Tape
Must Sacrifice
Call
(404) 351-6609

DEC

BRAND NEW • FULL 90 DAY WARRANTY

DEC 1200 BAUD PRINTERS

LA120-AA	EIA, KSR, Keyboard Only	$1,995
LA120-RA	EIA, Keyboard & Keypad, KSR	2,075
LA120-RA	Receive Only	1,795

CASH PRICES ● IN STOCK
IMMEDIATE DELIVERY

CALL SONJA OR LAURIE AT:
(614) 889-0810

SCHERER'S
MINI COMPUTER MART
6145 Dolen Place Dublin, Ohio 43017

BRAND NEW*WARRANTY*ATD

DATAPOINT EQUIPMENT

4520 with 5 MB Disk Drive and Multiport
9232 240 CPS Belt Printer
3601 CRT
4220 with 5 MB Disk Drive and Multiport
9236 160 CPS Matrix Printer
2 9402 Modems
A Wide Variety of Application Software Available
Plus 40 Disk Packs
CALL (417)226-4404

AVAILABLE

IBM 4341-M02 8 meg

CPS Expanded Feature #1601

IBM 370/158 Model 1	6 meg
IBM 370/158 AP Model 1	6 meg

IBM 3211/3811
Kodak KOMSTAR Micro-film processor

ON-LINE BUSINESS SYSTEMS, INC.
115 Sansome Street
San Francisco, CA 94104
415-391-8555
(Ask for Don Eichler)

SALE PURCHASE

DATA GENERAL

S/140, 256KB, CIS, FPIS
NV8000
C/330, 256KB, EAU
CS/60, CS/40, CS/30
Nova 4x, 3/12, 2/10, 840, 830
Micro Nova, 64KB, I/O
M600
Eclipse 256KB & 128KB Memory
6183 TP2
Nova 3 64KB Memory
ALM-16, ULM-8, SLM-2, DCU 200
AMI-8, ATI-16, 4062, DCU-50
6061 160 MB Disk System
6045 10 MB Disk System
6066 10 MB Disk System
4234 62 MB Disk System
4067 25 MB Disk System
6102 12.5 MB Disk System
6039 Dual Floppy
6026 D/D Tape System
6300 Graphics Term
6040 TPI Terminal
6053/6012/D100/D200 CRT's
4251 Comm Chassis

AMES SCIENCES, INC.
301/397-3140

DOCUMATION 2250 PRINTERS

Available Now
Call Bob Bryant

ECONOMIC DATA CORPORATION
650 S. Cherry St. Ste. 506
Denver, CO 80222
(303)399-4666

COLA Member Computer Dealers & Lessors Association

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate.)

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are $97.30 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $194.60 per insertion. Extra space is available in half-inch increments and costs $48.65. Box numbers are $10.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: _____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Signature: _____

Name: _____

Company: _____ Title: _____

Address: _____

Telephone: _____

Send this form to:
CLASSIFIED ADVERTISING,
COMPUTERWORLD
375 Cochituate Road, Box 880,
Framingham, MA 01701

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

DEC

SYSTEMS & COMPONENTS

C.D. SMITH & ASSOCIATES, INC.
12605 E. Freeway,
Suite 318
Houston, TX 77015
713-468-2384
TELEX 76-2547 CDSMITH HOU

CONTROL DATA

FOR SERIES/1

CRT's	DISKS	PRINTERS
610-14	270-10 (64MB)	420-10 (MATRIX)
610-10	271-10 (126MB)	420-12 (MATRIX)
		450-20 (LINE)

COMPUTER OPTIONS, INC. 800-328-5718 812-544-8660

"THE BEST OPTION"

COI

Computer Options, Inc.
1080 S. Hwy. 100 #428W
Minneapolis, MN 55416
812-544-8660
800-328-5718

BUY • SELL • LEASE

4331 3340 3350 3344 3370 4341 3420 3411

FOR SALE OR LEASE

IBM PRINTERS

3268-2

AVAILABLE for 30-DAY DELIVERY
CALL: 800-528-6113
Craig Alan West

GREYHOUND COMPUTER CORPORATION

IBM
3851-A2
(2) 3830-3
Available June
Call:
Ruth Levy
(415) 955-0277

"THE BEST OPTION"

COI

COMPUTER OPTIONS, INC.
812-544-8660
800-328-5718

BUY • SELL • LEASE

SERIES/1

(Systems and Peripherals In Stock)

Inflation Fighters

Quality & Savings

Slightly used. Money Back Guarantee. Full Reels. All External Labels Removed. Guaranteed for use at 1600 BPI through 6250 BPI

2400' Reel	$4.95 ea.
1200' Reel	$4.25 ea.
600' Reel	$3.50 ea.

All Tapes with Hanging Seals
We pay freight on orders over 200 tapes
All orders shipped within 48 hours
Call or Write
Computer Tape Mart
169 B New Highway
Amityville, New York 11701
(516) 842-8512

INTERSTATE COMPUTER EXCHANGE

IBM

S/34

BUY•SELL•TRADE
SHORT TERM LEASE

S/38 • Series 1 • S/32 • 5110 / 5120
All GSD and DPD Equipment

- All Sys / 34 Configurations available
- We customize any 34 Configuration
- Guaranteed IBM Maintenance
- 25% to 30% Off IBM List on 34's
- All Peripherals and Upgrades
- Wanted! Rented or Owned 34's

Call PAUL CAYTON — 714/578-5410

DATALEASE

SPECIAL PRICES on DEC TERMINALS

VT100-AA	$1,399*
VT101-AA	$ 995*
VT125-AA	$3,295*
VT131-AA	$1,575*
VT132-AA	$1,650*
LA38-GA	$1,095*
LA120-GA	$2,295*
LA180-PA	$1,100*
VT18X	$2,400*

*Quantity One — Cash Price

DATALEASE is proud to be an Authorized Digital Terminals Distributor

800-854-0350

Anaheim 714-632-6986
Los Angeles 213-748-3000
San Jose 408-287-7338
New York 516-231-0430

Registered Trademarks of Digital Equipment Corporation

FOR SALE

Honeywell H66/DPS440

Single Processor — 2MB/16 MOS .75 ms
6 — 200 MB Mass Storage Units
3 — Tape Units
1 — 1200 LPM Printer
2 — System Consoles
2 — Communications Processors
(25 — VIP7801 Green Phosphor CRT's)

Crated and Ready to Ship Jan. 15/83
Will Consider Breakup of System

Cenlor Services Ltd.
P.O. Box 2550
Calgary, Alberta
Canada
T2P 2M7
Phone D.R. (Doug) Salt
(403) 294-5339

We·buy·sell·and lease·IBM Computer Systems

Available for Immediate delivery!

PEARL EQUIPMENT COMPANY, INC.

BURROUGHS

TD830 CRT's
B1855 Complete Systems
B4890 CPU
B950 Complete Systems
B9246-20 2000 LPM printer
Complete tape subsystems

BSI
2480 W Alameda Ave
Denver Colorado 80223
(303) 922-8331
Telex 910-931-0483

XRXDS COMPUTER SALES

SERIES/1 5110

S/34 S/38 S/3 S/32 S/23

We Buy, Sell and Lease All IBM Products

800-328-3884 612-929-7143
P.O. Box 24010 Minneapolis, MN 55424

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

DEC SYSTEMS

Software support, complete installation

Immediate delivery on
11/780, 11/750, 11/70, 11/44, 11/24, 11/23
New & used disk & tapes
RM05, RP06, RM03, RM02, TS11, TU77
Non DEC peripherals, CDC, Kennedy, Emulex
Terminals and options
VT-100, LA120, DZ11, FP11's, DUP11's

Call (408) 738-3368

IDS International data services
1020 Stewart Drive
Sunnyvale, CA 94086 TWX 172-189

Buy & Sell

FOR SALE
IMMEDIATE AVAILABILITY
IBM System 3 15D25
BSCA Attachment, 23-LDA Ports
With 3340 A2, 3344 B02 Disk
5-3277 MOD 2
1-3278 MOD 2 Display
1403 MOD 5 Printer
Tape Attachment
IBM Maintenance Guaranteed
KORODY-COLYER CORP.
Contact: DEAN ORMAN
213/830-0330

2914
4 X 8
Available Now
Call Bob Bryant
ECONOMIC DATA CORPORATION
650 S. Cherry St. Ste. 506
Denver, CO 80222
(303)399-4666
CDLA Member Computer Dealers & Lessors Association

HP
INTEL Network Proc 3000/30/33
ADCC Main/Extender 3000/30/33
128KB Memory Array 3000/30/33
AIRBORNE DATA SYSTEMS
ADS
1112 Wrigley Way
Milpitas, CA 95035
(408) 262-6137

DEC SALE

SAVE UP TO 79% OFF DEC LIST!

CPU's		COMMUNICATIONS	
1134A-XX	(new) $9975	DH11-AD	(new) $6750
1134A-XE	(new) $8500	DH11-AD	(used) $4995
11X44-CA	(new) $23850	DL11-W	(new) $695

DISK DRIVES		MEMORY & MISCELLANEOUS	
RK711-EA/PA	(new) $11850	MS11-LB	(new) $2095
RK07-EA	(new) $8675	KK11-A	(new) $2395
RK05F-FA	(used) $1195	BA11-KE	(new) 2495
RL02-AK	(new) $2700	MR11-EA	(new) $795
RX211-BA	(new) $2875	FP11-F	(new) $2495
RXV21-BA	(new) $2875	FP11-A	(new) $2475
RK11-D	(new) $1095	KW11-P	(new) $695

New 11/23, 11/34A and 11/44 systems similarly priced-call for details

All equipment fully warranted and eligible for DEC maintenance • In stock and ready for immediate delivery.

800-645-1167

For Sale By Original Owner
Available Immediately
IBM System 7 -
Disk, Printer, Digital I/O.
PDP 12 -
Tape, Video, Analog I/O.
Nova 1200
Under Maintenance
Excellent Condition
City of Hope Medical Center
1500 E. Duarte Rd.
Duarte, CA 91010
213-359-8111, Ext. 2344

FOR SALE
DEC PDP 11/34
- 256K
- (2) 300 Line Printers
- (1) VT 100 Terminals
- (3) VT52 Terminals
- (2) RK07
- $30,000
- Immediately Available
- DEC Maintained

(714)231-2727

BUYING?

Whether you're looking for big computers little computers, terminals, printers, software, time sharing or services, you'll find it in *Computerworld* classifieds.

Pages of ads every week, with everything from Discs to DEC's from time sharing to terminals, and software for every size computer system.

You'll find what you need in *Computerworld* classifeds.

COMPUTERWORLD

Call 800-343-6474
(or 617-879-0700)
for more information

BUY SELL LEASE

FOR SALE

3271 - 02, 3272 - 02 w/3250's
3274 - B01, C21, B21
3276 - 02
3277 - 02, 4630, 4631, 4633
3278 - 02, 4621, 4622, 4627
3279 - A2, B2, B3

CONTACT:
TOM GIBSON

DATA AUTOMATION CO., INC.
[illegible] Road
[illegible]
(214) [illegible]

CDLA

MEMOREX EQUIPMENT
For Sale or Lease
1/2 MEMOREX MINIMUM PRICING
DISK
3674, 3672, 3670, 3673
3675, 3650, 3643
TAPE
3226,3226
MEMOREX Certified
Immediate Delivery
Federal Banc Corp.
(314)569-8440

SYSTEMS BUY/SELL PERIPHERALS
WANG
DATA PROCESSING &
WORD PROCESSING
PCS, 2200T, MVP, VP, LVP, VS
WPS 5 Models 1, 2, & 3
WPS 20, 25, 30
CPU's, CRT's, Disk & Tape Drives,
Printers, Memory Upgrades
ERST International (212) 431-1160

DEC
2020,2040,2060
SYSTEMS
AVAILABLE NOW—
DEC MAINTAINED
For these and other DEC 20 systems requirements, please call:
C.D. SMITH
713-451-3112
TELEX 76-2547 CDSMITH HOU

[illegible]
[illegible] 3380-[illegible]
[illegible]
[illegible] DENSITY w/3420-3's & 7's [illegible]
[illegible] CRT's/3271 Controllers/3284 Printers
[illegible] (201) 844-2360
Princeton Computer Associates Inc.

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

NCR

NCR 646-201 Printer
w/Train (120 LPM)
(5) 656 Disk Packs (200MB)
(20) 657 Disk Packs (30MB)
(36) 656 Disk Packs (4.8MB)
All Equipment eligible
for NCR Maintenance
• Must Sacrifice
Interactive Systems
Norman Cohen
(404) [illegible]

FOR SALE OR LEASE
NCR
8550
8570
8585M
Eligible for NCR maintenance
HARWOOD & ASSOC.
2 Northgate Park, Ste.304
Chattanooga, TN 37415
Tel.(615)870-8500

Call
1-800-343-6474
to place your ad.

BASIC FOUR

BASIC-FOUR 730
160K, 2-73MB Disk, 4 VDT's, 300 LPM, 1 MTC, 4 Tables, 1-1200 Modem, 2 Disc packs, 4-100 ft. cables
Immediate Delivery
$75,000
Best Offer
Contact: Steve Dawson
(313) 851-7270

DESK TOP COMPUTERS

(2) Apple II Computer Systems 64K
3 floppy disk drives
2 Sanyo video screens
2 TIOMNI 800 printers
Corvus hard disk 20 MB
Panasonic video cassette backup recorder
2 ABT numerical pads
Heavily Discounted
Contact Mr. Wallace (305)[illegible]

MISC. SYSTEMS

FOUR PHASE IV/90 [illegible] 1
96K CPU 24K Disk Controller
67.5MB Disk Drive & 2.5MB Disk Drive
9 Video Terminals 1 Asynch Controller
Software Included
Very Reasonably Priced
Available Now
C-SYSTEM INC.
(303)695-9370

S. E. L. 32/77
by owner - 3/4 meg, 80 meg disk, 2 ADDS boards, 4 screens, 300 LPM printer w/ u. c., 9 track tape, 3230A rack and console, MPX-32, Fortran, other software. All current rev. and under SEL maintenance. $75000 or b. o. Mark Rain, Penobscot Research, Deer Isle, Me. 04627.

DATAPOINT
1134's (6) Systems
(4) 1100 Processor w/4 Diskette Drives, 1 Meg Storage
$1500. ea. or Offer
Call: Bob Kaye
(617) 739-7800

For Sale Never Used
DATAPOINT 1800 COMPUTER
(TORTILLA)
64K, 2MB disk drives, 180 CPS printer, CRT (1920 characters)
$12,000
PHILOTECHNOS
Call Philip DuNoyer
(212)684-7117

DATA GENERAL

ASI

6067 50MB	$15,000
6125 New	$5800
4218 300LPM	$5500
ECLIPSE 256KB	$4900
ATI-16 New	$300
6030 Dual Diskette	$2250
D400 CRT	$1956
6053 CRT	$1800
Diablo 1620-3	$1800

(217)351-7962

Nova 3/12, 64KB Core
ULM5, 2-Cassette I/O
20MB Cartridge Disk
7 1/2 Inch, 12 1/2 IPS Tape
(1) 6053 & (1) D100 VDT
Single Bay 72 Inch cabinet
All for $15,000 or Best Offer
(206) 643-0800

DEC

WANTED TO BUY:
DEC - 2060
Needed prior to September,1982.
Principals only.
Contact Robert Knight
(415)497-1360

New Printer
600 Line/Min.
$6500
Dataproducts
In stock
Band w/stand
Ed: (714) 549-2688

DEC Terminal Sale

LA 34-DA	$800
LA 120-RA	$1750
LA 120-AA	$1950
VT 132-AA	$1600

Cash Price limited to quantity on hand.
Computer Datacom
(714) 540-6327

• DECWORD VT 102-WA
Word Processing Terminals
• PDP 11/23, RL02 Systems
Other DEC Systems and Terminals Also In Stock
SPARTIN SYSTEMS
14925A Memorial Drive
Houston, TX 77079
Tel.(713)496-0771

DEC MEMORIES

11/70 1/2MB, MK11CE	$5475
11/70-11/60 128KB	$1875
VAX780 1MB, MS780DC	$8750
VAX750 1/2MB,MS750AB	$5475
11/44 256KB, MS11MB	$3165
11/34 256KB, MS11LD	$2165
11/34 128KB, MS11LB	$1485

CALL RAY (617)275-6800

MK11-BE
128KB MOS Memory - NEW
$1800 each
Less in quantity
WESTEC
Call Dan Lundy
(206)641-7363

DEC NEW & USED

D356D-CY	(NEW)	$33,000
11/34A-YE	(NEW)	$10,500
DMC11-AL/MA	(USED)	$3750
FP11C	(NEW)	$4,950

Systems • Options • Peripherals
LAKEWOOD COMPUTER CORP.
(408)266-2545

FOR SALE BY OWNER
DEC PDP 11/70 SYSTEM
128K Memory, 1.5MB MOS memory, (3) RP06-176MB disk, (2) RH-70 MASSBUS controller, (1) TU16 Tape drive, floating point hardware, K-12 educational software included for qualified buyer
Contact C. Sarlick or Dutch Gran
(209)296-8011

New
PDP-11/34A
ONE ONLY
BY OWNER
67% OFF LIST
CALL CHRIS
(303) 674-2591

RSTS SECURITY
LOCK-11
Dave Mallery-NDD
215-364-2800

VAX-11
On-site courses
• FORTRAN T/S User
• FORTRAN Programmer
The cost is $3,200 per week
Mini and Micro Educ. Services
(800) 824-7888 Ext. M4573
(800) 852-7777 Ext. M4573

HONEYWELL

200/2000 SERIES
BROWN COMPUTER SERVICE,INC.
BUYS, SELLS/LEASES, and [illegible]
Complete and partial systems & peripherals with up to 50% discount on current HONEYWELL prices.
Exclusive HONEYWELL Dealer
In Business Since 1976
Call or write W.E.Brown at:
1080 Southcrest,Arnold,MO 63010
(314)[illegible]

HEWLETT PACKARD

HP-1000
(9800 DeComputer)
64KB w/RTE-II and IMAGE/1000
15MB Disc, Paper tape reader
16-Port Mux, Fast FORTRAN
Under HP Maintenance
Perfect Condition
Alm [illegible] Services, Inc.
P.O. Box 350126
Ft. Lauderdale, FL 33335

TI

Texas Instrument
990 CPU, (2) DS10 Drives and Console with 32K available memory.
Call: L. H. Matthews
(513) 948-8811

TI990/12 Model 36
In stock for immediate sale to highest bidder one TI990/12 model 36 with secondary DS300 disk drive and two (2) additional DS300 master kits. All equipment new from the factory, uncrated, with remaining TI warranty. Interested parties may call (314)876-5362 for additional information or purchase bid.

MODEMS

IBM 3864 MODEM
4800 BPS
MAIN DATA PRODUCTS,INC.
406 Main St.
Metuchen, NJ 08840
CONTACT: MIKE SIMON
Tel.(201)494-2610

PRINTERS

Dataproducts
New B-600
600 Line/Minute
With Stand
In Stock
$6500
Ed: (714) 549-2688

TERMINALS

New Tektronix 4014-1
Graphics Terminal
$12,775
Immediate Delivery
Buy Sell New and Used
Tektronix
(215) 885-6633

IBM

IBM 029 Keypunch
Available Immediately
Excellent Condition
$1200.
Contact:
Robert Sandak
Phone: (212) 644-1780

For Sale
129-3
4601/Interpret
Immediate Delivery
(305) 566-4405

SYSTEMS 32/34/38
Lease or Sale
Want to buy S/34's (for inventory)
Models & Peripherals.
We Pay Cash
LEAS PAK INTERNATIONAL
530 Bedford Rd.,Ste.250
Bedford,TX 76021
Tel.(817)[illegible]

IBM 3274's
AVAIL. NOW
CALL
313-656-1900
REGIONAL COMPUTER SALES
805 Oakwood Drive, Ste.200
Rochester,Michigan 48063
AuTex U92

FOR SALE
Available 5/15/82
(1) 3370-A1
(1) 3370-B1
(2) 3278-02
(1) 3742
Available Now
(1) 3274-021
(4) 3278-02
Call: Tom Cooper
(800) [illegible]

AVAILABLE MID JUNE,1982
(1) 3375-A1
(3) 3375-B1
THE DAVIDSOHN GROUP
(212)480-0149
Ask for Mr. Davidsohn

FOR SALE
System 34
CPU Model 5340 F37, Dual Magazine Drive, 3262 Printer Attachment.
Contact: Dan Hightower
(504) 733-2514

IBM System 34
5340-F37 CPU
256K/M/256MB
Asking 68% of List
$6,000 Under Market
1-800-328-3884
(612) 929-7143

SYSTEM/38
We have new System/38 software available...
NEED TO BUY System/38 Customer Mailing List.
Henry Camferdam
(317) 842-6300

IBM 5120
Assume 4 year lease with cash rebate.
Bob McGrath
(305) 821-3100

IBM 5340 MODEL F36
(4) 5251-11, (1) 5211-2,
(2) 5251-12, (1) 5256-2
Immediately Available
For Sublease
12 to 36 months
ECCO BAY SPORTSWEAR INC.
Contact Mr. Zalaznick at
(212)354-8000

IBM System 34
64K, Model C23
5211 Model 2 Printer
With 2 5251 Display Stations
$33,500
Buckley Assoc. Inc.
(901)365-2280

IBM

IBM SYSTEM 34
Complete Systems Available
Disk Upgrades
IBM 5110 & 5120
Maintenance Guaranteed
Word Process Software Avail.
IBM Equip. Bought For Cash!
NATIONAL DATA SYSTEMS, INC.
60 Congress, Boston, MA 02109
617-720-1210

AVAILABLE NOW
(For 3340 Disk Drives)
IBM DISK MODULES
3348-70
(70 Megabyte Capacity)
(1) NEW (Still in Plastic) $800
(2) USED (Return Guaranteed)
$400. Each
Shipped freight paid to your location
J. [illegible]
(216) [illegible]

FOR SALE BY OWNER
AVAILABLE MAY 1, 1982
IBM 3741-2
with 4002,6677,8123,1680
IBM 3717 Fast Printer
IBM 3742
with 5455,4004,6065
CALL MEL (616)345-5816

SERIES/1
Payroll Package
• EDX Version 3.1
• Runs in 14K
• Source plus user's guide
$950
SYSTEMS & SOFTWARE
35346 Northmont
Farmington Hills,MI 48018
(313)553-2280

IBM SYSTEM 32 MODEL B34
13.7 MB DISK 155 LPM
$8500
UNITED DATA
(415)421-3141

SYSTEM 34
BUY - SELL - LEASE
ANY CONFIGURATION
DISK AND MEMORY UPGRADES
Datacomp Computer Leasing Co.
Call Bill Quinn
(312) 448-4300

For just $99 your ad can be seen on The Bulletin Board

MISC.

COMPUTER FLOORS
Used-New
Bought-Sold
Installation
Alteration
Refinishing
Parts and Service
RC PULSE ASSOCIATES,INC.
16 Voorhis Lane
Hackensack,NJ 07601
(201)[illegible] or (212)[illegible]

WRIGHT LINE SAFE
FOR SALE
1 year old $2,700 new, sale price $2,000 available June 1, 1982. FOB Old Greenwich CT
Contact: R. Latham
Stern Metals
(203) 637-5461

Wanted-Wholesale Dist. Pkg. for HP 3000
On-line; full integrated OE/AR/IC/AP/GL package for HP 3000 for high volume Consumer Products Company.
Call: Steve Glick
Abu-Garcia Inc.
(201) 227-7666

XEROX 800
WANTED
Word proc.; must have datacom.
G. Wheatley
913-383-3000

ORDER FORM
COMPUTERWORLD BULLETIN BOARD

Issue Date: Ads can be accepted up until the Monday preceding the issue desired. Computerworld comes out every Monday.

Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications are Altos, Burroughs, Control Data, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Salvage, Sperry Univac, Teletype, Terminals, TI, WANG, Miscellaneous.

Copy: Copy for your ad must be clearly typewritten and may be sent in via the mail or by telecopier (telecopier extensions are 410 and 451). Ads may be given over the phone to our team of ad-takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is $99.00 (One unit minimum and no fractional units allowed). There are no agency commissions and no quantity discounts.

Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Issue Date(s): ______

Signature: ______

Name: ______

Company: ______ Title: ______

Address: ______

Telephone: ______

Send this form to:
COMPUTERWORLD BULLETIN BOARD
375 Cochituate Road, Box 880
Framingham, MA 01701

SOFTWARE FOR SALE

Introducing the first general accounting software specifically designed for IBM System/38.

LAWSON ASSOCIATES now offers general accounting software that's not merely compatible with your IBM System/38, but state-of-the-art to fully utilize its capabilities. Compare it with other software. You'll find a total software solution you just can't find anywhere else.

DESIGN FEATURES: They include: on line systems using data base management; menu driven, user friendly programs written in RPGIII, the System/38 language; and integrated modules. Their benefits: ease of installation and use, plus maximum employee productivity.

INTEGRATED MODULES: Those available include: General Ledger and Report Writer/Accounts Payable/Accounts Receivable/Fixed Assets/Payroll/Purchase Order

SERVICE FEATURES: Fully documented and supported. Onsite training and implementation. One year warranty. Available now for immediate installation.

For more information, please call or write:

IN MINNEAPOLIS:
Ken Holec
Software Sales Manager
Lawson Associates
2021 East Hennepin Ave
Minneapolis, MN 55413
(612) 379-2633

LAWSON ASSOCIATES, INC.

IN DALLAS:
John Novotny
Software Sales Manager
Lawson Associates
4099 McEwen, Suite 504
Dallas, TX 75234
(214) 233-4474

General Ledger System

Have problems getting timely reports from your accounting system? Need better control over your financial reporting? Use PLYCOM's General Ledger Package for accounting software that is easy to use, yet effective. Includes excellent support, complete documentation and:

- Easy to use menus
- Completely interactive
- Excellent audit trail
- User defined ledger codes
- Budget reporting
- Historical reporting
- Departmental reporting
- Flexible consolidations
- User defined financial reports
- Multiple financial statements
- Detail or summary data retention
- On-line account inquiry
- Interfaces to Payables, Receivables and Fixed Assets Packages
- For PDP-11's using RSTS/E

Plycom. services, inc
P.O. Box 100
Plymouth, IN 46563
(219) 935-5121

PDP-11 & VAX USERS Have More Control With

MAPS

Financial Modeling
- Construct budgets
- Develop forecasts
- Multi-level consolidations
- "What if" analyses

FINANCIAL SOFTWARE
"Canned" For Easy Use!

INTAC

Interactive Data Handling
- Efficient data storage
- Easy-to-use commands
- Powerful transaction processing
- Relation-like data access
- Interactive inquiry
- Unique report generator

Free trial and money-back guarantee. Call today for details.

ross systems
1900 Embarcadero
Palo Alto, CA 94303
(415) 856-1100

SERIES/1

DATA ENTRY SYSTEM

Data Entry using IBM IDES II is now available on EDX operating systems utilizing 4978 or 3101 terminals. Our product is powerful enough to replace CMC/PERTEC*, ENTREX*, FOUR PHASE*, CADE* key disk system in a single partition program.

Demonstration and trial installation available immediately. Direct inquires to:

Datronics Systems, Inc.
1729 N. Central Expwy
Plano, TX 75075
214/422-7711

SYSTEM/34

EXPAND YOUR RPG II CAPABILITY

A total of 22 enhancement modules are available in 3 package sets, offering functions not previously available in RPG II. Two OCL enhancement modules also available.

Contact: Lou Forlini

DOXCL
Doxal Systems Corporation
8283 Leesburg Pike, Falls Church, Va. 22041
(703) 821-2100

THE TIME SAVERS

RPG to COBOL
or for those PL/1 Shops
RPG to PL/1

Two of the many successful translators offered by Dataware provide a smooth and effortless transition from RPG. The translators can handle most any level of RPG (SYS/3, Mod 20, etc.) and achieve an extremely high percentage of automatic conversion (approaching 100%) of the source code.

For more information please call or write today!

The Conversion Software People
Dataware, Inc.
2865 Elmwood Ave., Buffalo, NY 14217 (716) 876-8722 | TELEX 91510

SPECIAL OFFER TO CLASSIFIED ADVERTISERS IN

COMPUTERWORLD/MEXICO

The Hottest New Newspaper in the Hottest New Computer Market!

Looking for a new market for equipment, services, software or used computers?

Thirty thousand readers of this Mexican newspaper are looking for you.

Come together at $1.50 per agate line on a 5 column page like this one (minium 30 lines/one column).

Write or call: Albertina Monjardin
Computerworld/México **Oaxaca 21-2 México 7, D.F.**
Tel: (905) 514-4218, 514-6309. We'll translate your ad for $5.00/page--and set type free.

software for sale | software for sale | software for sale | software for sale | software for sale

YOUR HP3000
WAS MADE FOR COLLIER-JACKSON'S FINANCIAL ACCOUNTING SOFTWARE
...and we planned it that way.

Actually, COLLIER-JACKSON created DESIGN/3000 exclusively for the HP3000.

It's a set of completely on-line Financial Control Systems written in COBOL II and utilizing V/3000. COLLIER-JACKSON will help you install them as stand-alone modules or an integrated system, complete with 90-day warranty and ongoing support.

- Payroll (PAYPLUS/3000)
- General Ledger (LEDGER/3000)
- Accounts Payable (FPS/3000)
- Accounts Receivable (ARS/3000)

DESIGN/3000 AND HP3000... MADE FOR EACH OTHER.

COLLIER-JACKSON, INC.

5406 Hoover Blvd.
Tampa, Florida 33614
(813) 885-6821

2104A West 25th St.
Lawrence, KS 66044
(913) 749-0923

Insight

FINANCIAL PLANNING, GENERAL LEDGER & REPORTING SYSTEM FOR IBM SYSTEMS /34 & /38
CALL:
Interactive Program Products Inc
800 Second Ave, New York 10017
(212) 752-5252

Make your IBM System/34 work harder for you.

FactFinder™
Data base information system accesses the computer with simple English commands. Inquiries, reports, graphs.

WordPower™
Advanced full function word processing...from letter writing to documentation. Easy text entry and editing.

EasyPlan™
Easy-to-use, electronic financial planning and modeling system. Produces financial work-sheets, consolidations, projections, "What-if" analyses.

DaisyWriter™
Compatible, high quality, low-cost daisy wheel printer. Interchangeable plastic and metal wheels. More than 100 type styles.

RMS
Complete, integrated set of application software modules for order processing, distribution, production, and financial management.

Information Systems
Design, development and implementation of custom information management systems.

From word processing to financial planning...consulting to programming...PCR has the resources to help you maximize your IBM System/34 productivity.

Professional Computer Resources, Inc.
2021 Midwest Road, Oak Brook, IL 60521
In Illinois call: 312/932-2200
Outside Illinois: 800/323-3331
San Francisco: 415/461-7580
New York: 201/944-9460

pcr professional computer resources

Elegant Software

For IBM S/34 & S/38 Computers

- General Ledger/Financial Reports
- Accounts Payable
- Accounts Receivable
- Payroll/Personnel
- Order Processing
- Inventory Management
- Mailing Lists
- Fixed Assets
- Oil & Gas
- Job Cost

J. D. Edwards & Company
Two Denver Technological Center
Englewood, CO 80111
303/ 773 3732
Dallas/ 214/ 484 8911
Newport Beach/ 714/ 751 5302

Do you have problems to market your software packages in Europe?
We can support you on a freelance basis. We are 2 former system programmers on IBM mainframes and have 6 years experience in marketing OS and DOS software packages throughout Europe. We speak 4 languages.
Please write to Computerworld, CW-A3230, Box 880, Framingham, MA 01701

DATAPOINT USERS CONVERT TO RMS
Gateway Associates will convert your DOS Software to RMS, Datapoint's newest and most flexible operating system. We will also lend our RMS expertise to RMS users.
Contact:
James Wallace
Gateway Associates, Inc.
300 Montgomery Street
Suite 800
San Francisco, CA 94104
(415) 397-5500

MEDICAL MANAGEMENT SOFTWARE

- Totally Menu Driven
- Fully Documented
- Easy-to-Use by office Staff
- Written in MCBA-style Dibol
- Single user license $995
- Includes source code
- Compatible with MCBA software

For DEC RSTS/E (CTS-500) systems.
Send or call for more information:
Gary, Stasch, Wells & Co.
700 E. Main Building, Ste. 1700
Richmond, VA 23219
(804) 649-0351

GSW

IBM SERIES / 1 REPORTWRITER EDX

- SAVES PROGRAMMERS TIME
- USER FRIENDLY
- NEW REPORTS IN MINUTES
- VERSATILE

LEVEL I - $1250 LEVEL II - $1750

i-concepts, inc.
2500 Royal Lane
Dallas, Texas 75229
(214) 243-0700

DEC SOFTWARE
GENERAL ACCOUNTING
AP, AR, PR, GL, INV

DIBS-B/DECMATE/COS 310	$350 each
CTS 300 MCBA	$750 each
CTS 500 MCBA	$750 each
DEC Insurance Agency	$1,500
DEC Type 300	$1,400
Real Estate Rental 300	$800
Job Cost 300	$750
DRS Programs	call
MCBA Modifications	call

Source, license, manual included
40% cash with order, balance on delivery

David Talbot
Interstate Data Systems, Inc.
214 West Main, P.O. Box 472
Urbana, Illinois 61801-0472
Tel. (217) 337-1144

BUSINESS OPPORTUNITY

Computer-world's classifieds work.

ROMAC.
The Profitable Transition!
If you're an individual seeking a business opportunity that will challenge your initiative, ROMAC may be your answer.
We are a successful personnel consulting firm, serving the accounting, finance, data processing and banking professions. We offer ownership in a vital and growing business network. With a moderate investment and experience in any of our fields, the challenge and personal satisfaction of owning your own business can be yours.
For details, call or write: President, 139 High St., Boston, MA 02110, 800-841-8888
Offices in:
Arlington, VA Dayton, OH Philadelphia, PA
Atlanta, GA Fairfield, CT Portland, ME
Boston, MA Hartford, CT Rochester, NY
Buffalo, NY Newton, MA Stamford, CT
Cranston, RI Paramus, NJ Tampa, FL

SOFTWARE WANTED

WANG VS SOFTWARE
We need the following interactive systems that will run effectively on a Wang VS Computer:
1. Accounts Payable
2. Fixed Assets
3. General Ledger
4. Purchase Orders

These systems must:
1 Be properly documented
2 Be written in COBOL
3 Take advantage of the Wang VS features

If you sell the software described above please send information concerning these systems to:
Peter Cangelosi
Gas Research Institute
8600 W. Bryn Mawr Ave.
Chicago, IL 60631

SOFTWARE WANTED

IBM Systems. Applications Software Products. Advanced Information Systems, Inc. (AIS) is seeking to purchase or acquire exclusive marketing rights to software products written for IBM computers. Consider what we can offer. **Please contact: Paul Gennaro,** Advanced Information Systems, Inc., 7923 Jones Branch Drive, McLean, Virginia 22102.

(703) 442-4715

TIME & SERVICES

FORTRAN-COBOL
on RSTS PDP 11/70
Flat Rate $500 per port
No connect or CPU charges
Timenet access
CONTACT:
James F. Kelley
INSLAW, Inc.
Washington, D.C.
(202) 628-8600

LOOKING FOR DEVELOPMENT TIME?
NO KILOCORE TICK CHARGES
NO CPU CHARGES
$7 PER HOUR CONNECT TIME
RSTS-E TIME
BASIC PLUS, BASIC PLUS, PASCAL, C } WITH CROSS COMPILER SUPPORT
EDIT } PROGRAM EDITING
BUDGET BYTES 212-944-8230
by OMNICOMPUTER, INC.
1450 Broadway, New York, N.Y. 10018

time & services | time & services | time & services

MEMORY & COMPUTER REPAIRS

ANY MANUFACTURER'S MEMORIES
CORE — SEMI
DEC® — DATA GENERAL
COMPLETE CPU'S AND MEMORIES

T D C

THREE DELTA CORP
1038 Kiel Court, Sunnyvale, CA 94086
(408) 734-2980
TWX-910 339-9511

COMPUTER TIME AVAILABLE

4341 4 MEG
DOS/VSE, VS1, MVS, VM/370, CICS, SNA, EP Communications

Contact:
Don Benson
(617) 449-5310

COMPUTER TIME FOR SALE

I.B.M. 360-40

All Shifts, 128K, 4-2401 MOD-2, 9-2314, 1403-N1, 2540,

From $35/Hour

Restaurant Associates, Inc.
1540 Broadway
New York, N.Y. 10036
Contact:
Al Palmo (212)997-1411

NVIP

GERMANTOWN VALLEY INFORMATION PROCESSING INC.

OFFERS THE POWER OF THREE 3033'S (MVS) AND TWO 158-3'S (AP)
3000 LASER PRINTING
3000 MASS STORAGE

OPERATING SYSTEMS: MVS, JES2, VM, DOS/VSE, VSE/POWER VS1
INTERACTIVE: TSO, SPF, WYLBUR, ROSCOE, CICS, CMS, CMS/SPF
REMOTE (MTCH): RJE, BISYNC, SDLC, ASYNC
NATIONWIDE COMMUNICATIONS NETWORK

COBOL, FORTRAN, PL1, PL10PT
PASCAL/VS, RPG
BASIC, APL, DUO, SPSS,
SAS, LIBRARIAN, FDR
SYNCSORT, FPS,
ADRS II, IMS, IDMS

AVAILABLE 24 HOURS PER DAY, 7 DAYS PER WEEK
COMPLETE TECHNICAL SUPPORT

VERY COMPETITIVE PRICES

CONTACT YOUR NEAREST NVIP SALES OFFICE

PHILADELPHIA 215-322-3372
NEW YORK 212-684-7640
WASHINGTON 703-527-0888

NATIONWIDE VAX-TIMESHARING

- BASIC COBOL FORTRAN
- $1,500 MONTH UNLIMITED CONNECT TIME INCLUDES COMMUNICATION COST FROM TYMNET CITIES!
- $.75 HOUR CPU TIME
- CENT PER BLOCK STORAGE

Ed Stone
1-800-354-9206

Amdahl V8

12 meg
Timesharing

MVS-JES2-TSO-APL-SAS
CICS-ROSCOE-3350-ACF2

Dial Up or Leased Line.
All shifts
Technical Support Available
Contingency Processing

Contact Bo Sellers
704-525-8610
Network Computer Corp.
Charlotte, N.C.

Computer Services

4341-2 370/158-3

VS1-CICS-ROSCOE-DOS
REMOTE JOB ENTRY
CICS DEVELOPMENT
CICS PRODUCTION
CUSTOMIZED SOFTWARE

CONTACT JOE BARRETT
(201) 777-3454
15 MINUTES FROM LINCOLN TUNNEL
ONE PASSAIC STREET
WOOD-RIDGE, N. J. 07075

TIMESHARING AVAILABLE

VAX 11/780-VMS
PDP 11/70-RSTS/E

- FORTRAN, COBOL, BASIC
- DATATRIEVE
- ORACLE ®
- STATISTICAL PACKAGES
- DECNET
- TYMNET ACCESS

CONTACT:
James F. Kelley
INSLAW, Inc.
Washington, D.C.
(202) 628-8000

® trademark of Relational Software, Inc

RSTS CHEAP!

on WALL STREET, NYC
Local error-free dial-in or leased line termination
and in PHILADELPHIA
DEC 11/70, 24 hrs. 7 days
Secure Backups
B+, B+2, DIBOL, COBOL81
WORD-11, TECO, EDT
Secured by LOCK-11

NATIONWIDE DATA DIALOG
DAVE MALLERY 215-364-2900

COMPUTER REPAIRS

DEC-NOVA
ALL BOARDS
CPU-MEMORY — I/O ETC.

MEMORIES AND POWER SUPPLIES
ANY MANUFACTURER

90 Day Warranty - 15 Day Turnaround

PRIME • TIME

550-II, 24 Hours, 7 Days
$6/ connect hour or
$400/ port/ month
$20/Mb/ Mo.
BASIC, PL/1, COBOL, FORTRAN 66, FORTRAN 77, DBMS, WORD PROCESSING, PRIMENET X.24
CALL FOR DETAILS
(614)459-0457

RENT TERMINALS OR TIME IN THE CLASSIFIED PAGES OF COMPUTERWORLD

Call
800-343-6474

SHARE TIME IN MASSACHUSETTS

- IBM 4341 - 4 MEG
VMSP/CMS, OS/VS1
EP Communications
Color Graphics, ADRS, Script/DCF, PMS, Q-8-E

Call Mark Sands
(617)366-5709

PL/I PROGRAMMING SHOP.

Have in-house Series I RJE station and TSO equipment. Work off-site, on-site. BAL, Series I Assembler, other languages. Contract or time and materials. Call Don Mitchell, (813) 932-5977.

ADVERTISERS' INDEX

Anritsu Electric Co. 18
Apollo ..... ID/8 & ID/9
Applied Data Research 3
Applied Information Systems 23
Arkay Computer ID/6
A T & T/ Long Lines 31
Atlas Energy Systems 56
Axios Products, Inc. 48

BDS Corporation 13
John Beall 69
Beehive International 71

Cambridge Systems Group 46
CGA Software 38
Circle Computer 11
Circle Software 48, 56
Comdesign 30, 48
Compatible Computer 18
Computer Corp. of America 40
Computer Devices, Inc. 72
Computeristics 10
Computer Knowledge Center 14
Computer Management Research 20
Computer & Terminal Exchange 63
Connecticut General 49
Continental Resources 18
Cullinane 19
CW Index 24
CW International 23
CW Supplement 27, 77

Datagram 8
Data Processing Design 42
Data Rentals/Sales, Inc. 57
Data Retrieval 42
Data Stream ID/6
D.B. Systems, Inc. 43
Digital Engineering 60
Digital Equipment Corp./Accessories & Supplies 23
Digital Equipment Corp./Educational Service 79
Digital Equipment Corp./Large Systems Group 26
DP Facilities 48
DTSS ID/2

Eastman Kodak Co. 64
Educational Cooperative 42
Electronic Data Systems Corp. 70

General Data Comm Industries, Inc. ID/11
General Electric/DCPBD ID/16
Genesys 12
Graham Magnetics, Inc. 22
Graphics Interface 35

H & W Computer Systems, Inc. 41, 70
Harris Corp. 43
Hewlett Packard ..... 44 & 45

IBM/SSD ..... 66 & 67
Infodata Systems, Inc. ID/5
Informatics ID/15
Innovation Data Processing 9
Intel 73
Interail ..... 28 & 29
IPL Systems, Inc. 76
ISE 52

K/W Controls 51

Lear Siegler ID/18
Lee Data Corp. 78
Local Data 30

Management Science America 110
Mantissa Corp. 11
MCAUTO Computer Services 16
MCBA 41
Memorex Communications Group 74
Memorex Media Products Group 21
MTI 4
MV Associates 32

NEC Information Systems 17

On-Line Business Systems ID/10

Perkin Elmer 75
Personal Office Computers, Inc. 78

Qwikterm 53

Radio Shack 54
Raytheon Data Systems 15
Rubbermaid Commercial Products ID/14

Salcris Corp. 8
Saturn Systems 90
SDI ID/3
Selanar Corp. ID/4
Softmatics 12
Software AG 25
Software Authority 47
Sperry Univac ..... 34 & 35
Storage Technology Corp. 99
Stratus Computer 68
Syncsort, Inc. 7
Syscd ID/3
Systems Documentation, Inc. 10

Technology Transfer 50
Telex Computer Products ..... ID/12 & 13
TelTech-Telecommunications Technology Corp. 27
Texprint 27
Times Fiber Communication ..... 36 & 37
Tone Software 30
Trans Net Corp. 16

Universal Data Systems 80
Universal Software 39
U R S 54

Verbatim 20
Vertex Systems, Inc. 31

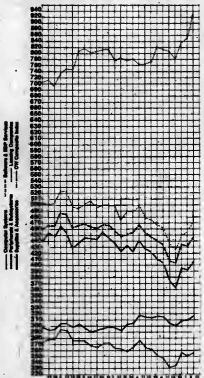
Wang Laboratories ID/17
Westwood Associates 30

Yourdon 5

Zentec Corp. 58

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computerworld Stock Trading Index



Computerworld Sales Offices

Roy Einreinhofer, Vice-President/Marketing. Donald E. Fagan, Vice-President/Sales. Frank Collins, Manager, Display Advertising. William J. Mills, Manager, Classified Advertising. Diane La Muraglia, Manager, International Marketing Services. COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, Mass. 01701, Phone: (617) 879-0700, Telex: 95-1153.

BOSTON SALES OFFICE: Chris Lee, Northern Regional Manager. Edward P. Marecki, Joseph Fitzhugh, District Managers. Kathy Doyle, Diane Sukey, Account Coordinators. COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, Mass. 01701, Phone: (617) 879-0700, Telex: 95-1153.

NEW YORK SALES OFFICE: Michael J. Masters, Eastern Regional Manager, Peter Senft, Doug Cheney, Ray Corbin, District Managers. Fred LoSapio, Sales Assistant. COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, N.J. 07652, Phone: (201) 967-1350.

CHICAGO SALES OFFICE: Dave Dolber, Newt Barrett, District Managers. Jan Raska, Account Coordinator. COMPUTERWORLD, 2600 South River Road, Suite 304, Des Plaines, Ill. 60018, Phone: (312) 827-4433.

LOS ANGELES SALES OFFICE: Jim Richardson, District Manager. Bob Hubbard, Debra Pendergrass, Account Managers. Beverly Raus, Account Coordinator. Eileen Dunn, Recruitment Account Manager. Phone: (415) 421-7330. COMPUTERWORLD, 18008 Sky Park Circle, Suite 260, Irvine, Calif. 92714, Phone: (714) 556-6480.

SAN FRANCISCO SALES OFFICE: William J. Healey, Western Regional Director. Barry G. Milione, Rick Jamison, Account Managers. Ruth Gordon, Account Coordinator. Eileen Dunn, Recruitment Account Manager. COMPUTERWORLD, 300 Broadway, Suite 20, San Francisco, Calif. 94133, Phone: (415) 421-7330.

JAPAN: Mr. Shohei Kurita, Shukan COMPUTERWORLD, 1-19-7 Shintomi, Chuo-ku, Tokyo 104, Phone: (03) 551-3882. Esteban H. Yamada, Tokyo Representative Corp., Yamaguchi Bldg., 2-12 Kanda Jimbo-Cho, Chiyoda-Ku, Tokyo 101, Phone: (03) 230-41178, Telex: J29880. **UNITED KINGDOM:** Richard Hease, ECC Publications, 30-31 Islington Green, London N1, Phone: (01) 359-7481. Euan C. Rose, BEFRE, HOBSON ASSOCIATES, 34 Warwick Rd., Kenilworth, Warwickshire, CV8 1HE, Phone: (0926) 512424, Telex: UK-311951. **WEST GERMANY:** Eckhard Utpadel, CW PUBLIKATIONEN, Friedrichstrasse 31, 8000 Munich 40, Phone: (089) 34-90-61, Telex: W. Ger-5-215350-HKFD. **AUSTRALIA:** COMPUTERWORLD PTY. LTD., 37-43 Alexander Street, Crows Nest, NSW 2065, Phone: (02) 439-5133, Telex: SECCO AA25468. **BRAZIL:** Eric Hippeau, COMPUTERWORLD do BRAZIL, Servicos a Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor, 20031 Rio de Janeiro, RJ, Phone: (021) 240-8225, Telex: 11-32017 (WORD BR). **MEXICO:** Richard Small, COMPUTERWORLD de MEXICO, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F., Phone: (905) 514-4218, (905) 514-6309. **FRANCE:** Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. **SPAIN:** Neil Kelley, COMPUTERWORLD/Espana, Barquillo, 38, Madrid-4. **DENMARK:** Helle Lind Christensen, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11.

CW COMMUNICATIONS/INC.
Board Chairman/Publisher
Patrick J. McGovern
President
W. Walter Boyd

VP-Research, Jack Edmonston. VP-Marketing, Roy Einreinhofer. VP-Sales, Don Fagan.
VP-Finance, William P. Murphy. VP-Circulation, Margaret Phelan.
VP-Production, Lee Vidmar. VP-Special Publications, Robert Ziegel.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 880, Framingham, MA 01701, Phone: (617) 879-0700, Telex: 95-1153.

SALES Vice-President, Donald E. Fagan. Display Advertising Manager, Frank Collins. Display Advertising, Tracey Eastman, Anne Hadley, Jenny Charlesworth, Julie Sullivan. Classified Advertising Manager, William J. Mills.

MARKETING SERVICES Vice-President, Jack Edmonston. Director Research, Kathryn Dinneen.

CIRCULATION Vice-President, Margaret Phelan. Circulation Manager, Barbara Jeannetti. Service Rep, Peggy Kelly. Assistant, Carmela Priante.

PRODUCTION Vice-President, Lee Vidmar. Production Manager, Peter Holm. Supervisor, Henry Fling. System Manager, Tom Pfau. Type Manager, Carol Polack. Art Director, Tom Monahan.

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES WEDNESDAY, APRIL 7, 1982

EXCH		1981-82 RANGE (1)	CLOSE APR 7 1982	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	18- 46	21	+1 7/8	+9.8
N	BURROUGHS CORP	28- 72	35	+ 1/4	+0.7
O	COMPUTER AUTOMATION	6- 20	8 1/2	+ 3/4	+9.8
N	CONTROL DATA CORP	18- 42	32 3/8	+2 3/8	+7.8
N	CRAY RESEARCH INC	25- 49	29 1/4	+1 1/2	+2.4
N	DATA GENERAL CORP	27- 67	35 1/4	+2 1/2	+11.0
N	DATAPOINT CORP	20- 68	25 3/8	+2 1/4	+9.7
N	DIGITAL EQUIPMENT	72-113	80 3/8	+4 5/8	+6.1
A	DECO INC	6- 18	7 3/4	+ 3/8	+5.0
O	ELECTRONIC ASSOC.	2- 13	7 3/4	+ 1/4	+3.3
N	FOXBORO	23- 41	34 1/8	+1 1/2	+4.8
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 18	4 3/4	- 1/2	-9.3
N	HARRIS CORP	28- 60	29 7/8	+1	+3.4
N	HEWLETT-PACKARD CO	33- 54	43 1/8	+2 3/4	+6.8
N	HONEYWELL INC	63-118	71 3/8	+3 3/8	+4.8
N	IBM	48- 73	61 3/4	+2	+3.3
O	IPL SYSTEMS INC	8- 13	8	+ 1/2	+6.0
O	MAGNUSON COMP SYSTS	3- 32	2 3/4	+ 1/8	+2.4
O	MANAGEMENT ASSIST	9- 26	12 5/8	+1 1/2	+12.3
O	MIGI-COMPUTER SYST	0- 4	1	- 1/8	-11.1
O	MODULAR COMPUTER SYS	7- 32	7	0	0.0
N	MOHAWK DATA SCI	10- 32	12 3/4	+1 1/4	+10.8
N	NCR	38- 78	41 3/4	- 3/8	-0.8
N	PRIME COMPUTER INC	17- 48	22 3/8	+1 5/8	+7.8
N	PERKIN-ELMER	18- 38	22 3/4	+2 1/2	+12.2
N	SPERRY CORP	27- 65	27 5/8	- 1/8	-0.4
O	TANDEM COMPUTERS INC	13- 35	28 1/4	+2 3/4	+11.7
N	TEXAS INSTRUMENTS	21-151	82 1/2	+3 3/4	+4.7
A	WANG LABS.	23- 46	26 1/2	+1 5/8	+6.8
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	18- 29	24 1/4	- 1/2	-2.0
N	COMDISCO INC	16- 27	23 3/4	+ 1/4	+1.0
O	COMMERCE GROUP CORP	1- 2	3/8	+ 1/8	+50.0
O	COMPUTER INVESTRS GRP	1- 4	1/2	0	0.0
O	CONTINENTAL INFO SYS	4- 9	2	+1 3/4	+33.3
N	DPF INC	0- 13	10 1/4	+ 1/4	+2.5
O	ITEL	1- 18	1	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 30	24 1/8	+ 5/8	+2.6

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 2 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		1981-82 RANGE (1)	CLOSE APR 7 1982	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 8	1 1/2	0	0.0
O	ADVANCED SYSTEMS INC	10- 18	12	+ 1/4	+1.9
O	ANACOMP INC	10- 18	12 1/4	+1 1/2	+13.8
O	ANALYSTS INTL CORP	3- 14	7 1/2	+ 1/4	+3.4
A	APPLIED DATA RES.	12- 25	20 1/4	+ 1/2	+2.8
O	ASTRADYNE COMP IND	2- 2	3	+ 1/4	+8.0
N	AUTOMATIC DATA PROC	22- 32	27 7/8	+ 5/8	+2.2
O	CGA COMPUTER ASSOC	4- 25	8 1/4	+1	+10.0
O	COMPUTER HORIZONS	1- 2	2 1/4	0	0.0
O	COMPUTER NETWORK	1 8	4 7/8	+ 1/2	+11.4
N	COMPUTER SCIENCES	12- 30	12 7/8	+ 1/8	+0.8
O	COMPUTER TASK GROUP	10- 23	10 1/2	0	0.0
O	COMPUTER USAGE	2- 10	2 3/4	- 1/4	-8.3
O	COMSERV CORP	8- 18	14	+ 1/4	+1.8
O	COMSHARE	7- 21	8 3/8	- 1/4	-2.9
O	CULLINANE DATABASE	15- 37	27 1/2	- 1/2	-1.7
O	DATA DIMENSIONS INC	0- 4	1/4	-1/16	-10.0
O	DATATAB	1- 4	7/8	0	0.0
O	DSI CORP	4- 9	3 3/4	-1 1/8	-23.0
O	SYATRON CORP	3- 11	3	- 1/8	-4.0
N	ELECTRONIC DATA SYST	15- 30	22 7/8	+1 3/8	+6.2
O	INFORMATICS INC	10- 23	17 3/4	+1 1/8	+7.8
O	INSYTE CORP	1- 3	1 3/4	0	0.0
O	IPS COMPUTER MARKET.	1- 4	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	4 1/2	+ 1/2	+12.2
N	LOGICON	12- 36	12	+ 3/8	+2.8
O	MGMT SCI AMER INC	17- 28	21 1/4	+2	+10.2
O	MATHEMATICA INC	12- 26	24 1/4	+1 1/2	+6.2
O	MATHEMATICAL APP GRP	14- 35	19 1/2	0	0.0
O	NATIONAL DATA CORP	14- 28	17 3/4	+2 1/8	+12.8
N	PLANNING RESEARCH	5- 12	7 7/8	+ 7/8	+12.5
O	PROGRAMMING & SYS	1- 2	1 1/2	+ 1/8	+13.0
O	REYNOLDS & REYNOLD	18- 28	18 1/4	+ 1/2	+2.8
O	SEI CORP	17- 28	23 3/4	+ 1/2	+2.1
O	SHARED MEDICAL SYST	26- 37	28	+ 1/8	+0.4
O	STSC INC	6- 28	7	+1	+16.6
O	SCIENTIFIC COMPUTERS	6- 16	7 1/2	0	0.0
O	SOFTWARE AG	7- 23	8 5/8	+ 7/8	+11.2
N	TYMSHARE INC	18- 58	20 7/8	+1 1/2	+7.7
N	URS CORP	11- 16	11 3/4	+ 1/2	+4.4
N	WYLY CORP	7- 20	8	+ 1/2	+6.6
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	1- 25	1 1/8	- 3/8	-23.0
A	ANDERSON JACOBSON	6- 26	10 1/2	- 3/8	-3.4
O	AUTO-TROL TECHNOLOGY	6- 62	8 3/4	- 1/2	-5.4
O	BANCTEC INC	13- 35	14 1/2	+1	+7.4
O	BEEHIVE INT'L	6- 18	7 1/8	+ 3/8	+5.6
A	BOLT,BERANEK & NEW	8- 28	17 3/4	+2 1/8	+13.5
O	CAMBEX CORP	2- 8	2 7/8	0	0.0
N	CENTRONICS DATA CORP	7- 40	10 7/8	- 3/8	-3.3
N	CETEC CORP	4- 8	4 1/4	0	0.0
O	COMPUTER DEVICES INC	4- 10	5 7/8	- 1/8	-2.0
O	COGNITRONICS	2- 11	2	0	0.0
O	COMPUTER COMMUN.	1- 2	7/8	- 1/8	-12.5

EXCH		1981-82 RANGE (1)	CLOSE APR 7 1982	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMPUTER CONSOLES	16- 28	22 7/8	+2 1/4	+10.0
O	COMPUTER TRANSCEIVER	3- 8	4 7/8	+ 3/8	+8.3
N	COMPUTERVISION CORP	20- 40	30 1/2	+3	+10.0
O	COMRAC CORP	17- 28	22 3/8	- 5/8	-2.7
A	DATA ACCESS SYSTEMS	2- 23	2 5/8	- 1/4	-8.8
A	DATAPRODUCTS CORP	17- 44	22	+2 3/8	+13.2
O	DATUM INC	2- 8	1 1/2	0	0.0
O	DAVID JAMISON CARLYL	3- 7	2 3/4	+ 1/8	+4.2
O	DECISION DATA COMPUT	3- 8	3	0	0.0
O	DELTA DATA SYSTEMS	2- 4	1 3/4	+ 1/8	+7.8
O	DATARAM CORP	4- 12	2 3/4	0	0.0
N	ELECTRONIC M & M	2- 8	3 1/4	+ 1/8	+4.0
O	EVANS & SUTHERLAND	18- 40	23	0	0.0
A	GENERAL COMPUTER SYS	1- 12	4 1/2	0	0.0
O	GEN'L DATA COMM IND	3- 16	6 7/8	0	0.0
O	GENERAL TERMINAL CP	0- 4	3/8	+1/16	+16.7
N	HAZELTINE CORP	18- 35	29 7/8	+1 5/8	+5.7
O	INFORMATION INTL INC	8- 17	11 1/4	0	0.0
O	INTEL CORP	21- 81	28 1/4	- 1/2	-1.7
O	IPL SYSTEMS INC	5- 18	8	+ 1/2	+6.0
A	LUNDY ELECTRONICS	7- 18	7 1/2	- 1/8	-1.6
O	ABI DATA CORP	11- 27	17 1/2	+ 1/4	+1.4
O	NETWORK SYSTEMS CORP	18- 29	20	+2 1/8	+11.8
O	OMEX	2- 8	3	0	0.0
N	PARADYNE CORP	29- 52	35 3/8	+2 3/4	+11.8
A	PENRIL CORP	7- 17	8 3/8	+1	+12.1
O	QANTEX CORP	8- 23	14 5/8	+ 5/8	+4.4
N	RECOGNITION EQUIP	4- 21	4 3/4	0	0.0
O	SCAN DATA	1- 3	1 1/8	+ 3/8	+50.0
N	STORAGE TECHNOLOGY	18- 40	27 3/8	+1 1/8	+4.3
O	SYKES DATATRONICS	8- 24	18 1/2	-2 1/4	-10.8
A	T BAR INC	12- 18	13 7/8	0	0.0
O	TEC INC	4- 11	8	-2	-19.1
N	TEKTRONIX INC	43- 70	50	+2	+4.1
N	TELEX	2- 8	8 3/4	+1	+12.0
O	TESDATA SYSTEMS CP	5- 17	5 1/2	0	0.0
O	TIMEPLEX INC	7- 18	8 5/8	+ 1/8	+1.4
O	WILTEK INC	1- 3	1 1/2	- 1/8	-7.8
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 12	12	+ 1/4	+2.1
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	10- 24	12 1/2	+ 7/8	+5.2
O	CYBERMATICS INC	1- 2	1	0	0.0
A	DUPLEX PRODUCTS INC	12- 17	12 5/8	+ 1/4	+1.8
N	ENNIS BUS. FORMS	16- 23	18 1/4	+ 3/8	+2.0
N	3M COMPANY	48- 65	54 1/8	- 3/8	-0.8
O	MOORE CORP LTD	27- 38	31 3/8	+ 5/8	+2.0
N	NASHUA CORP	16- 33	18 3/4	+1 7/8	+11.1
O	STANDARD REGISTER	30- 41	37	-1	-2.8
A	TAB PRODUCTS CO	14- 30	18	+ 3/8	+2.8
N	WALLACE BUS FORMS	22- 36	29 3/8	+ 3/8	+1.2

Installing an IBM 4321 or 4331?

Ask your IBM salesman about SSX. Ask your MSA salesman about System 43.™

The only interactive family of business software for IBM's SSX System.

Now there's a complete family of business application systems for your IBM 4321 or 4331 computer that gives you the power of mainframe software without programmers.

It's System 43™ from MSA. The first application software designed especially for IBM's new SSX (Small System Executive) operating system for the 4321 or 4331.

Improves productivity dramatically

How? Simple. With MSA's System 43, you get a system that's designed from the ground up to be used by your financial and accounting people without programmer assistance.

You don't need a highly qualified system operator. And even installation can be handled by anyone with a minimum of data processing experience.

Important breakthrough

IBM's new SSX operating system is the most important development in user-friendly system software ever. And with System 43, you can make the most of it.

To bring you System 43, MSA began with extensive pre-release field testing as a beta site for SSX.

Then we developed special versions of our own line of user-friendly business application software.

And with more than 6800 of our systems installed around the world, MSA software is user-proven and highly refined.

Put it all together and you've got System 43. You can only get it from MSA.

The only business application system you'll need

You get a complete menu of business application software designed specifically to operate with SSX.

System 43 eliminates the problems you face in evaluating and purchasing systems from different suppliers.

You don't have to worry about incompatibility between mismatched software systems. The application components available with System 43 function together to give you the information you need in a smooth, problem-free operating environment.

Documentation is concise and easy-to-understand because it's written in plain-English that won't confuse non-data processing personnel.

And with MSA's worldwide customer service team to support your systems, software maintenance is greatly simplified.

Talk to the software experts

Divisions of more than half of the Fortune 500 companies use MSA software systems, in addition to several thousand other organizations, many with their first computers.

At MSA, we offer the most comprehensive line of business application packages currently available from one source.

So you get a wider choice of application packages. And MSA Industry Specialists can show you how these systems will fit your company's software requirements.

These application components include all the same interfaces and online capabilities that come with other MSA systems.

MSA System 43™ Components
1. General Ledger
2. Accounts Payable System
3. Accounts Receivable
4. Encumbrance Accounting
5. Fixed Assets Accounting
6. Inventory and Purchasing System
7. Forecasting and Modeling
8. Personnel Management & Reporting
9. Payroll Accounting

You get more than software

When you choose System 43 software, you also get the software company. At MSA, we know it takes a lot more than a great software package to give our customers the kind of service they need.

That's why we provide on-going customer support that includes thorough documentation, periodic system enhancements, and continuous educational programs for your people.

Find out more

We'd like to tell you more about System 43 and other MSA systems.

For more information please contact Robert Carpenter, (404) 262-2376. Or just clip the coupon below.

MSA The Software Company

Management Science America, Inc.
3445 Peachtree Road, N.E., Atlanta, Georgia 30326

☐ Please send me more information on System 43™ and other MSA systems.
☐ Currently have IBM 4331 ☐ Planning to acquire IBM 4331.
☐ Planning to acquire IBM 4321.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
BUSINESS PHONE ( ) _____

CW7as2(04-12-82)